

**Environmental Assessment and Finding of
No Significant Impact**

2018 PLANNED TEMPORARY DEVIATION TO AFFECT RELIEF OF HIGH
WATER LEVELS WITHIN
WATER CONSERVATION AREA 3A

Broward and Miami-Dade Counties, Florida



**US Army Corps
of Engineers**®
Jacksonville District

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FINDING OF NO SIGNIFICANT IMPACT

2018 PLANNED TEMPORARY DEVIATION TO AFFECT RELIEF OF HIGH WATER LEVELS WITHIN WATER CONSERVATION AREA 3A (WCA 3A)

BROWARD AND MIAMI-DADE COUNTY, FLORIDA

I have reviewed the Environmental Assessment (EA) for the Proposed Action. This Finding incorporates by reference all discussions and conclusions contained in the EA enclosed hereto. Operations within the project area are currently governed by the 2012 Water Conservation Areas (WCA), Everglades National Park (ENP) and ENP to South Dade Conveyance System (SDCS) Water Control Plan, and subsequent approved deviations thereto.

The U.S. Army Corps of Engineers, Jacksonville District (Corps), is initiating a planned temporary deviation from the 2012 Water Control Plan in order to provide high water relief for Water Conservation Area (WCA) 3A. The WCAs (1, 2 and 3) are flooding in a manner that inundates tree islands and other wildlife habitat, and if sustained will negatively impact birds and mammals dependent on that habitat. If the rate of rise is not mitigated to limit the prolonged duration of high water conditions, there is potential for these high water levels to pose greater risks to valuable natural resources, public health, safety or welfare as the wet season and hurricane season continue due to reduced flood storage.

The Proposed Action includes opening of S-12A, S-12B, S-343A, S-343B and S-344 structures (referred to herein as Cape Sable seaside sparrow (CSSS) Closure Structures) on July 1, 2018 prior to their official opening date of July 15, 2018, pending further consultation with the U.S. Fish and Wildlife Service (USFWS) on June 29, 2018. These openings, if implemented, are expected to continue until July 15, 2018.

Expedited consultation of this planned temporary deviation was coordinated with various Federal and state agencies as well as federally-recognized Tribes. Emergency consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, is on-going with the USFWS under provisions of the 2016 Everglades Restoration Transition Plan Biological Opinion and is in full compliance with the ESA. All practicable means to avoid and minimize adverse environmental effects are incorporated into the recommended plan. Environmental commitments as detailed in the EA will be implemented to minimize impacts.

Under provisions of emergency consultation, the Corps has determined that the Proposed Action may affect, but is not likely to adversely affect, the endangered CSSS, endangered Everglade snail kite and threatened wood stork. Opening of the CSSS Closure Structures prior to the official opening date of July 15, 2018 will be implemented as part of this planned temporary deviation consistent with the emergency ESA consultation with USFWS to be completed on June 29, 2018.

Consultation on the Proposed Action is ongoing with the Florida State Historic Preservation Officer and the appropriate federally-recognized Tribes in accordance with the National Historic Preservation Act and consideration given under the National Environmental Policy Act.

The Corps has determined that the planned temporary deviation will have no adverse effect on historic properties eligible or potentially eligible for listing in the National Register of Historic Places. The Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, and the Seminole Nation of Oklahoma concurred with the determination of no adverse effect; however, coordination on effects with other interested parties is ongoing.

The Proposed Action is not anticipated to adversely affect water quality and water quality certification is not necessary. On June 20, 2018, the Florida Department of Environmental Protection (FDEP) issued an Emergency Final Order (EFO) in response to high rainfall and flooding in the South Florida Region (OGC No.: 18-1066). The EFO states that the Corps and South Florida Water Management District (SFWMD) are hereby authorized to make temporary operational changes in order to minimize detrimental impacts to the environment, to the public, to adjacent properties, and to downstream receiving water. The FDEP EFO waives the requirement for state water quality certification for this Federal Action. The EFO expires November 30, 2018. The Corps coordinated this deviation with FDEP on June 14, 2018. The Proposed Action is in compliance with the Clean Water Act. The Corps has determined, and the State has concurred, that the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of Florida's Coastal Management Program.

The Proposed Action will maintain the authorized purposes of the Central and Southern Florida Project, including flood control, water supply for municipal, industrial, and agricultural uses, prevention of saltwater intrusion, water supply for ENP, and protection of fish and wildlife.

The Corps completed this EA in accordance with ER 200-2-2 to address the federal action of the planned temporary deviation to the water control plan to address immediate concerns with high water levels within WCA 3A. The signed FONSI will be circulated for public review for a period of 15 days. The Corps may generate a supplemental EA as necessary to discuss and disclose any additional effects to the human environment that may not have been addressed within this EA.

All applicable laws, executive orders, and regulations were considered in the evaluation of the alternatives. In light of the above and the attached EA, and after consideration of coordination with Federal and state agencies and Tribal representatives, I conclude that the Proposed Action would not result in a significant effect on the quality of human environment; therefore, preparation of an Environmental Impact Statement is not required. This Finding of No Significant Action incorporates by reference all discussions and conclusions contained in the EA enclosed herewith.

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KIRK.JASON.ANTHONY.1118174956
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ou=USA, cn=KIRK.JASON.ANTHONY.1118174956
Date: 2018.06.30 21:11:04 -04'00'

Jason A. Kirk, P.E.
Colonel, U.S. Army
District Commander

30 JUN 2018
Date

**ENVIRONMENTAL ASSESSMENT
ON
2018 PLANNED TEMPORARY DEVIATION TO AFFECT RELIEF OF HIGH WATER
LEVELS WITHIN WATER CONSERVATION AREA 3A (WCA 3A)**

BROWARD AND MIAMI-DADE COUNTIES, FLORIDA

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**ENVIRONMENTAL ASSESSMENT
ON 2018 PLANNED TEMPORARY DEVIATION TO AFFECT RELIEF OF HIGH
WATER LEVELS WITHIN WATER CONSERVATION AREA 3A (WCA 3A)**

BROWARD AND MIAMI-DADE COUNTIES, FLORIDA

1.1 PROJECT PURPOSE AND NEED

1.2 PROJECT AUTHORITY

The Central and Southern (C&SF) Project for Flood Control and Other Purposes was initially authorized by the Flood Control Act of 1948, Public Law 80-858, approved June 30, 1948. The remaining works of the Comprehensive Plan were authorized by the Flood Control Act of 1954, Public Law 83-780, approved September 3, 1954. There have been numerous modifications to the original C&SF Project authority.

1.3 PROJECT LOCATION

The water management operating criteria related to the Proposed Action affects an area within the C&SF Project located in South Florida and includes Lake Okeechobee, the Caloosahatchee and St. Lucie estuaries, Water Conservation Area (WCA) 3, Everglades National Park (ENP), and adjacent areas. Features of the Proposed Action are located in Broward and Miami-Dade Counties (**Figure 1**).

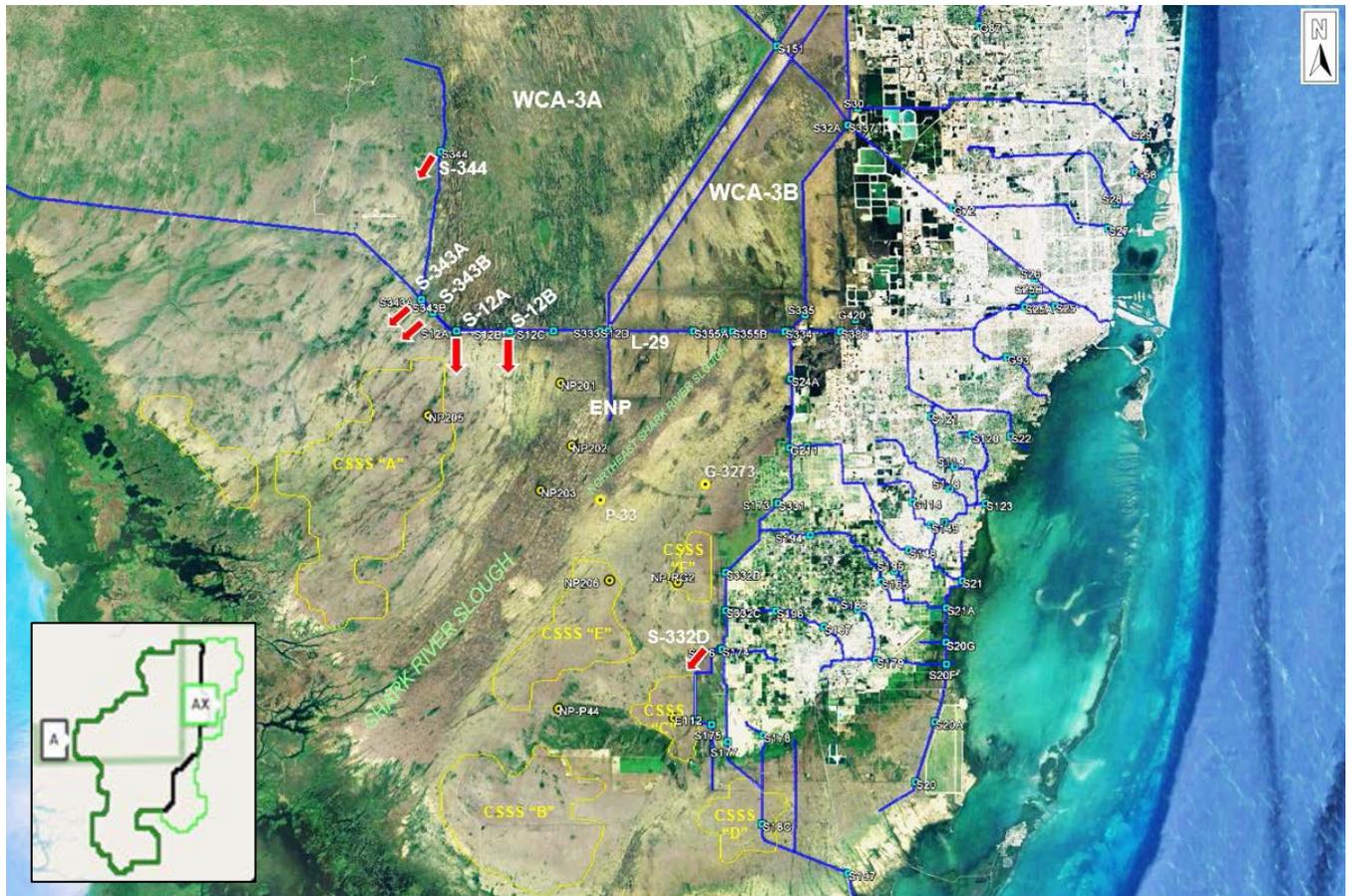


FIGURE 1. PROJECT LOCATION AND RELEVANT C&SF PROJECT FEATURES OF THE MWD PROJECT AND C-111 PROJECTS. THE INSET MAP SHOWS THE SUBPOPULATION A EXTENSION AREA (AX) FOR THE CAPE SABLE SEASIDE SPARROW.

1.4 PROJECT NEED OR OPPORTUNITY

The C&SF Project currently functions and was originally authorized to function as a multi-purpose water management system. The Congressionally-authorized purposes of the C&SF Project include flood control, agricultural irrigation, municipal and industrial water supply, preservation of fish and wildlife, water supply to ENP, preservation of ENP, prevention of saltwater intrusion, drainage and water control, groundwater recharge, recreation, and navigation. Operations within the project area are currently governed by the 2012 WCAs, ENP and ENP to South Dade Conveyance System (SDCS) Water Control Plan, and subsequent approved deviations thereto (USACE 2012; USACE 2016; USACE 2017). These include the Modified Water Deliveries to Everglades National Park (MWD) Project: G-3273 Constraint Relaxation/S-356 Field Test and S-357N Revised Operational Strategy Increment 1 Plus (Increment 1.1 and 1.2); hereafter referred to as MWD Increment 1 Plus (USACE 2016) and the 2018: L-29 Canal and G-3273 Constraint Relaxation Including the Northern Detention Area (Revised Operational Strategy Increment 2); hereafter referred to as MWD Increment 2. The Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for MWD Increment 1 Plus is dated February 16, 2017. The EA and FONSI for MWD Increment 2 is dated February 21, 2018.

The U.S. Army Corps of Engineers, Jacksonville District (Corps) is seeking a planned temporary deviation from the 2012 Water Control Plan, and approved deviations thereto, in order to provide relief from high water stages within WCA3A. The Proposed Action would be implemented July 1, 2018 and would terminate July 15, 2018.

A series of mid-May storms have caused conditions to change rapidly from very dry conditions to very wet in South Florida, with Lake Okeechobee, the WCAs and the eastern coast of Florida accumulating most of the rainfall. Table 1 and **Figure 2** illustrate the widespread period-of-record rainfall for the month of May for southern Florida, with the area as a whole receiving 301% of average rainfall. WCA 3 alone received 12.33 inches in precipitation since May 1, which is 285% of the average for this time of year. This May (2018) was the wettest on record within the SFWMD Service Area with 11.5 inches (previous record was 9.25 inches in 1895) recorded. This record area-wide rainfall has caused water stages in the three WCAs to rise above their maximum regulation schedules, as shown in **Table 2**. In addition, Lake Okeechobee and the Everglades Agricultural Area (EAA), which sends excess water south into the WCAs when capacity is available, has also received a significant amount of rainfall, further exacerbating the sharp rate of rise in the WCAs in May and June 2018. **Table 2** shows the stage and excess volume of water contained in these areas. There are currently 908,725 acre-feet of excess water retained within the three primary WCAs, computed based on the volume difference between current water stages and the floor of the respective WCA Regulation Schedules.

TABLE 1. TOTAL PRECIPITATION EXPERIENCED WITHIN THE C&SF PROJECT ACTION AREA BETWEEN MAY 2, 2018 TO JUNE 1, 2018

Area	Precipitation (inches)	% of Average
Lake Okeechobee	10.69 inches	344% (average 3.11 inches)
East EAA	11.09 inches	293% (average 3.78 inches)
WCA 1 and WCA 2	16.87 inches	397% (average 4.25 inches)
WCA-3	12.33 inches	285% (average 4.32 inches)

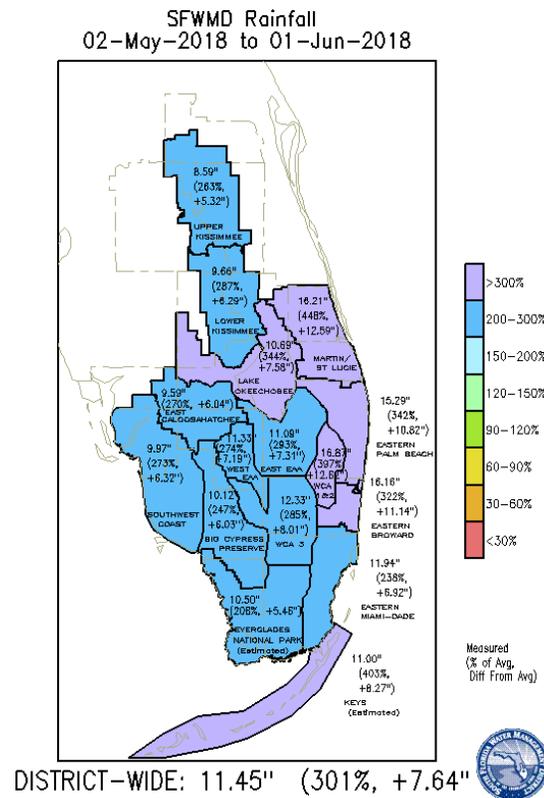


FIGURE 2. SOUTH FLORIDA WATER MANAGEMENT DISTRICT RAINFALL MAP (MAY 2, 2018-JUNE 1, 2018)

TABLE 2. WCA STAGES COMPARED TO REGULATION SCHEDULE AS OF JUNE 15, 2018

Area	Current Stage (feet NAVD)	Regulation Schedule (feet NAVD)	Deviation from Regulation Schedule (feet)	Volume Above Schedule
WCA 1	15.96	15.75	0.21	31, 450
WCA 2A	15.57	11.00	1.57	165,800
WCA 3A	10.84	9.40	1.44	711,475

Total 908,725 acre-

Due to the unprecedented rainfall during May 2018, WCA 1, WCA 2A and WCA 3A are all above Zone A of their respective regulation schedules (**Table 2; Figures 3-5**), limiting the operational flexibility of the system. The stages within WCA 3A are the most concerning because construction, environmental constraints, and current system capacity limit the volume of water that can be moved out of the system. WCA 3A is the last downstream storage area in the C&SF Project, and it has extremely limited outlet capacity. Its regulation schedule is currently above the maximum regulation schedule and the maximum historical elevation for this time of the year, as shown in **Figure 6**. Immediate action is necessary to move flood water out of WCA 3A, and

subsequently provide opportunities to move more water south out of the WCAs. Therefore, the Corps is initiating a planned temporary deviation from the approved 2012 Water Control Plan (and subsequent modifications hereto) for purposes of alleviating high water conditions within the project area. The Proposed Action is expected to mitigate for severe ecologic and economic losses that could result from prolonged high water levels. Loss of natural resources directly affects fisheries and fishing, seafood harvesting and ecotourism.

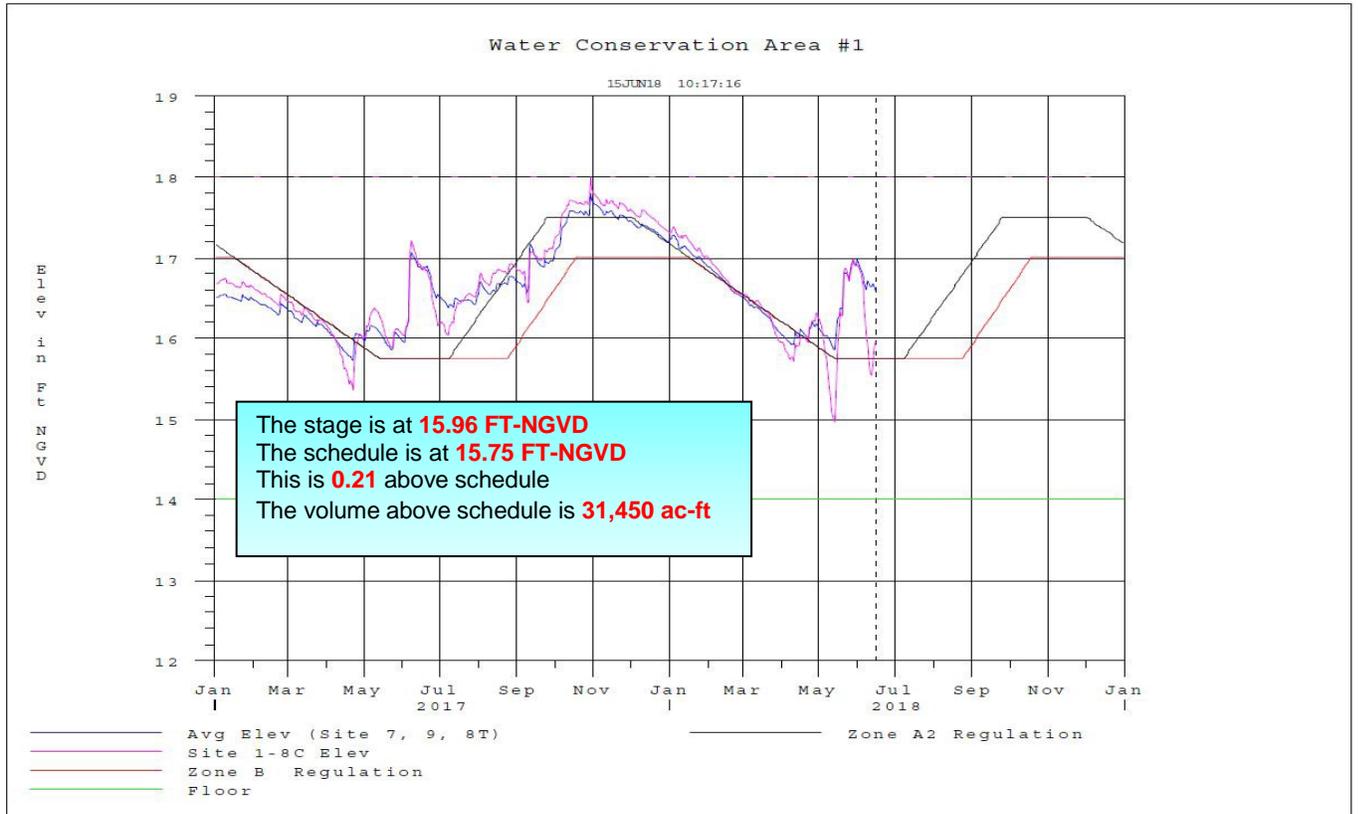


FIGURE 3. WCA 1 STAGE HYDROGRAPHS AND REGULATION SCHEDULE

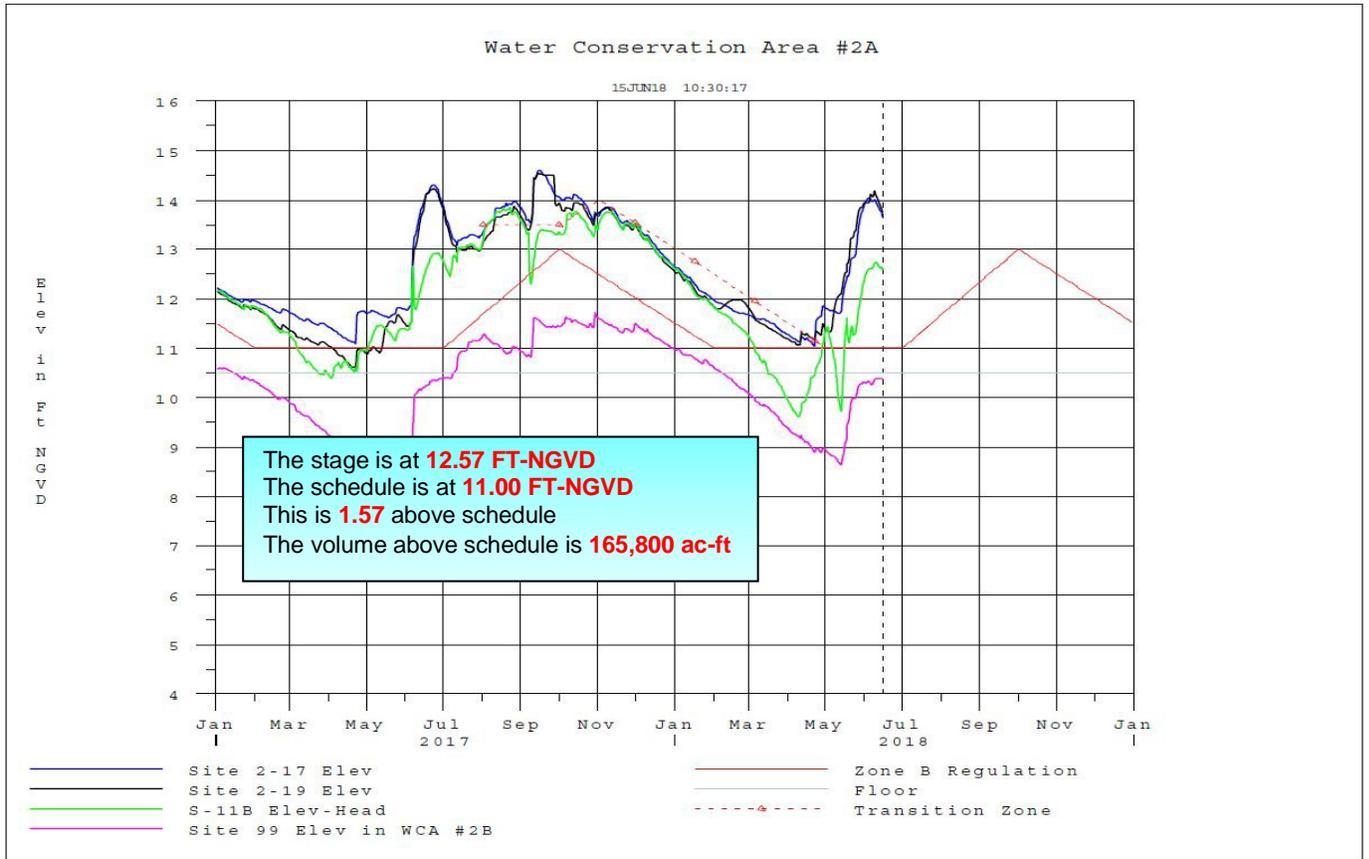


FIGURE 4. WCA 2A STAGE HYDROGRAPHS AND REGULATION SCHEDULE

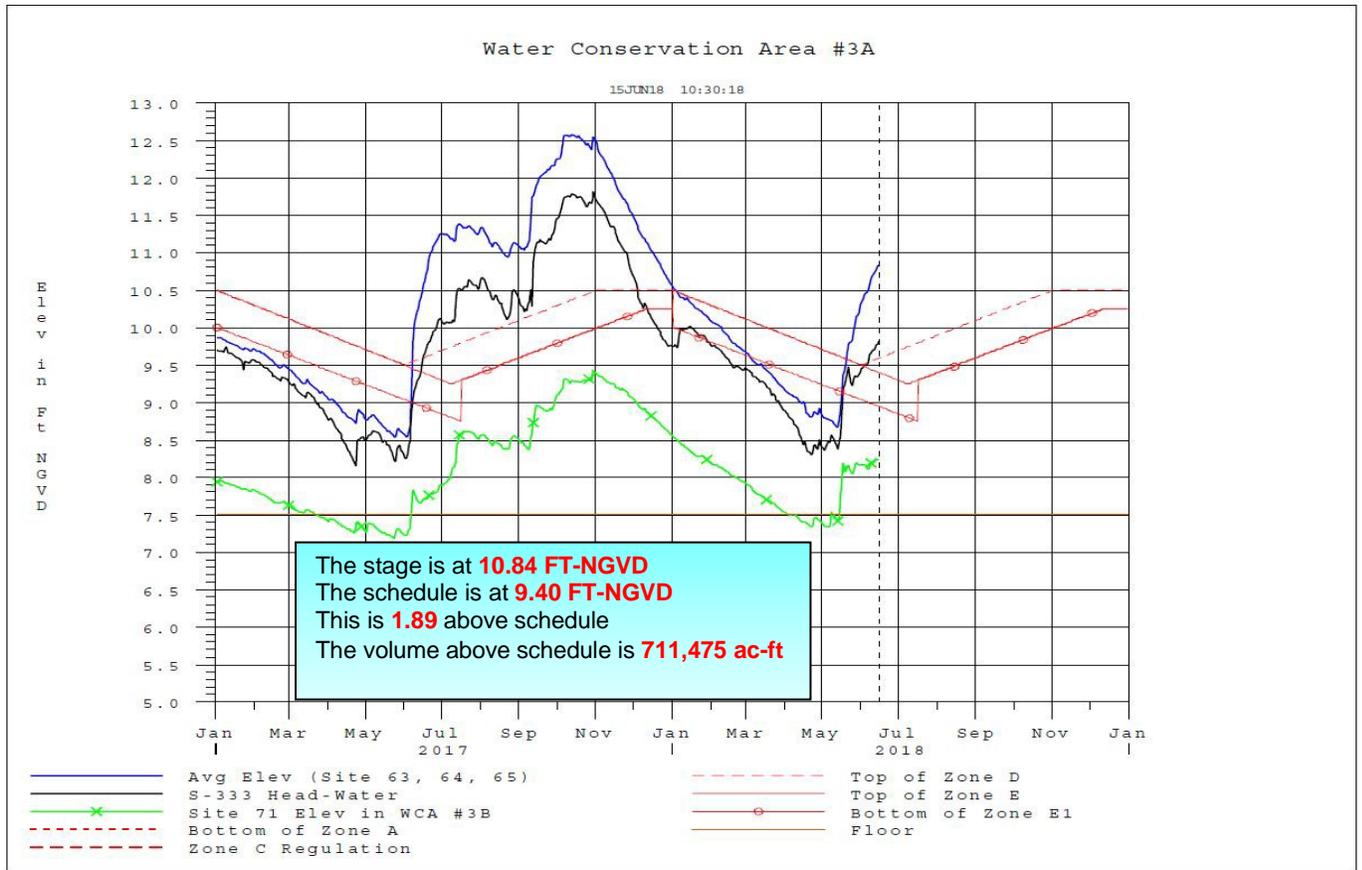


FIGURE 5. WCA 3A STAGE HYDROGRAPHS AND REGULATION SCHEDULE

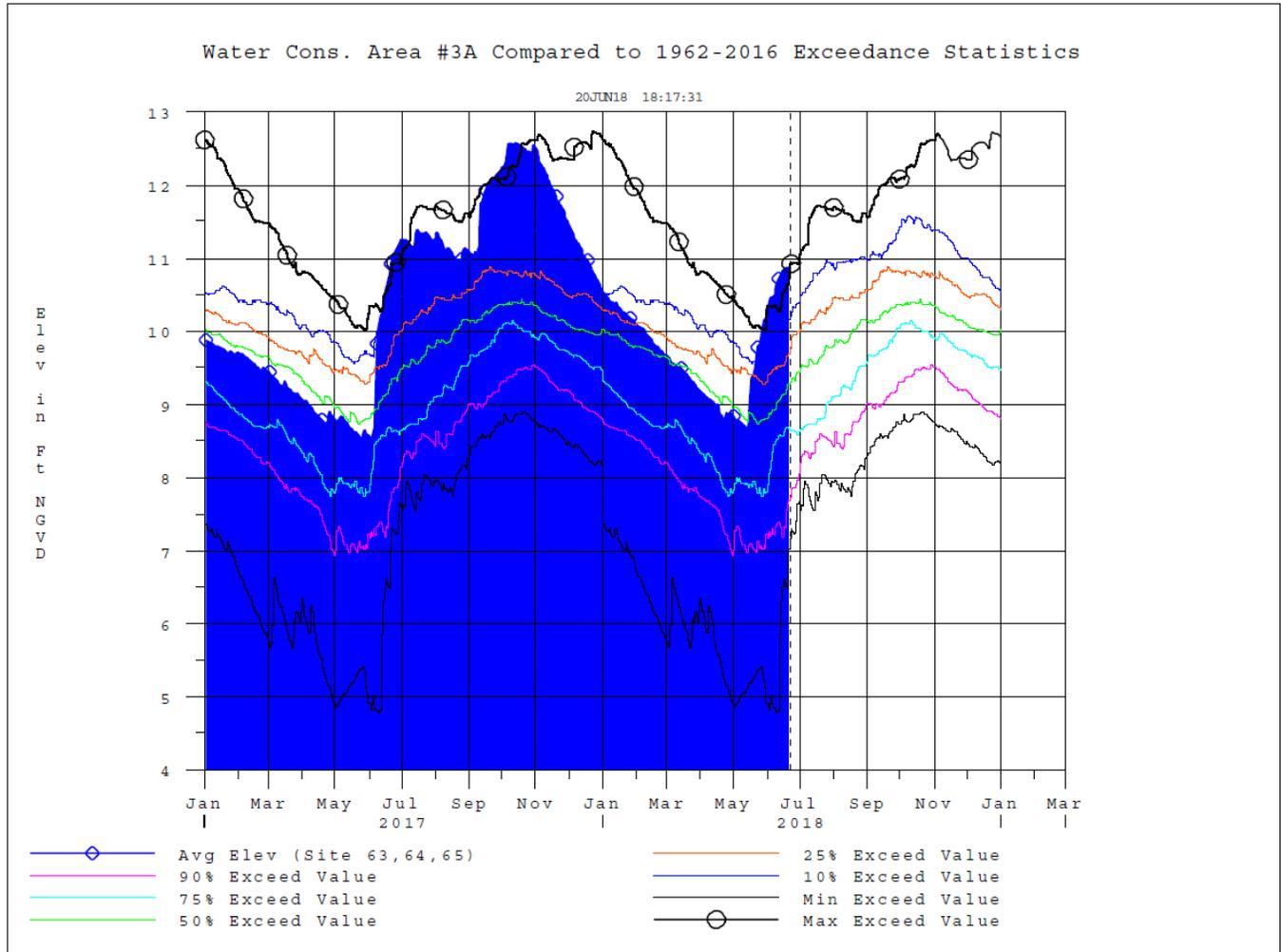


FIGURE 6. WCA-3A STAGE HYDROGRAPH AND EXCEEDANCE STATISTICS

The extraordinary rainfall, which has resulted in the amount of water shown above, has caused the WCA-3A 3-gage average stage to rise at a rate of approximately 0.27 feet per week. The S-12A and S-12B gated spillways, two of the five main outlet structures for WCA-3A, are currently closed through July 14 in accordance with the Increment 1.1 and 1.2 Operational Strategy and the 2016 Everglades Restoration Transition Plan Biological Opinion to prevent additional surface water inflows towards Sub-population A of the endangered Cape Sable Seaside Sparrow (CSSS).

A position analysis has been completed by the South Florida Water Management District (SFWMD) and the Corps to forecast future water levels in the WCAs. Results from the SFWMD analyses are presented in **Figure 7**. The analysis indicates that there is a 50% chance water levels in WCA 3A will likely not recede below Zone A until January at the earliest (P50).

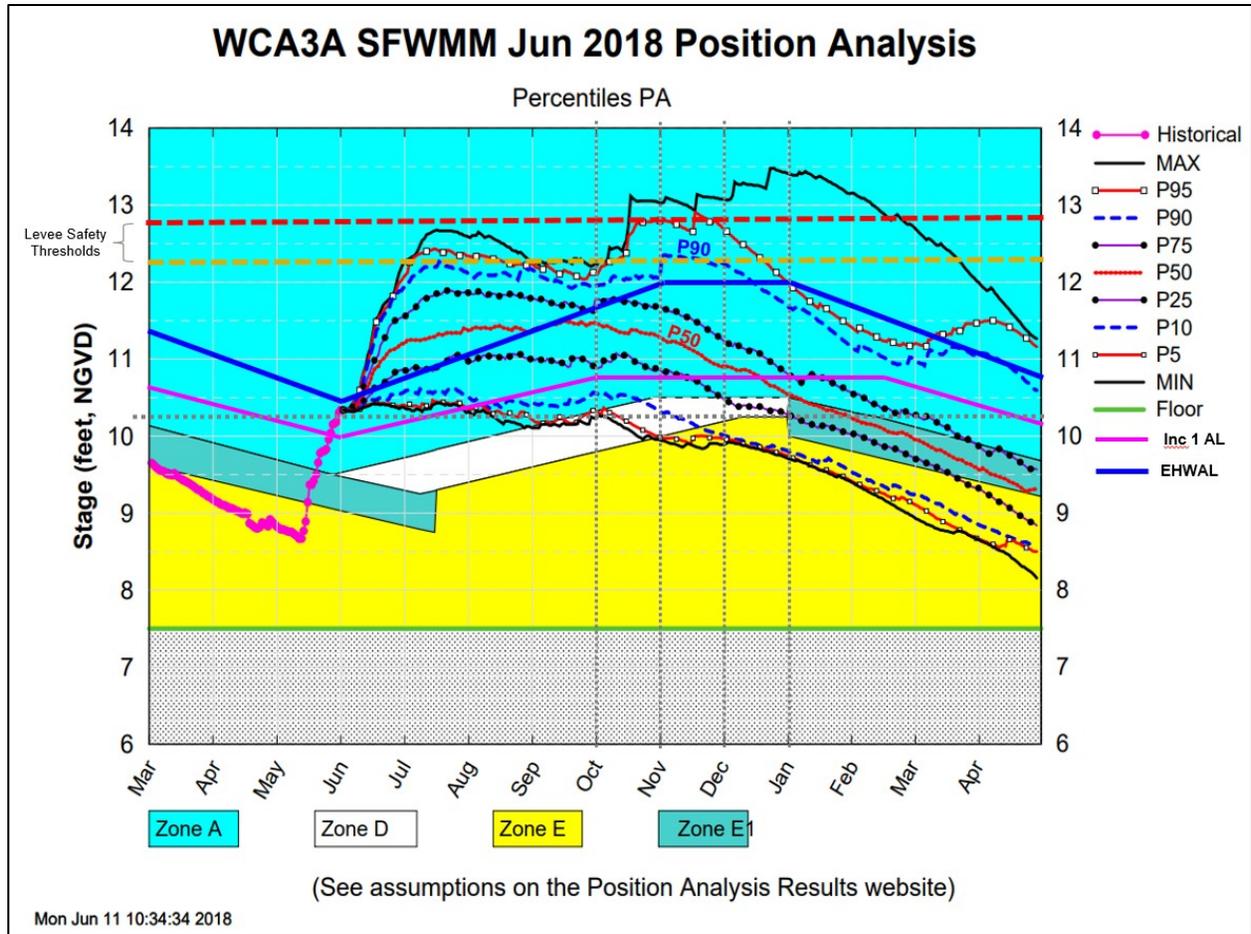


FIGURE 7: WCA-3A SFWMM 01 JUNE 2018 DYNAMIC POSITION ANALYSIS

The Corps is currently releasing the maximum amount of water out of WCA 3A to help mitigate these high water stages under the current operating criteria, however, water continues to flow into WCA 3A due to WCA 2A being above regulation schedule. The S-11s are currently releasing an estimated 3,500 cubic feet per second (cfs) into WCA 3A as of June 15, 2018. There are additional structures and structure capacities available to release water from WCA 3A, but they are currently not utilized due to restrictions. Without these restrictions, the estimated combined flow rate from WCA 3A could reach approximately 3,500 cfs and, at this rate, it would take approximately 151 days (5 months) to move 933,800 acre-feet of water out of WCA 3A. The current and full discharge capacities of WCA 3A outlet structures are listed in **Table 3**.

TABLE 3: CURRENT AND FULL DISCHARGE CAPACITIES OF WCA-3A OUTLETS

Structures	Flow (cfs) as of 15	Estimated flow (cfs) if no restrictions or
S-12A	0	300
S-12B	0	300
S-12C	590	590

S-12D	730	730
S-333/S-334	570*	570*
S-343A	0	200
S-343B	0	200
S-344	0	200
S-151**	0	0
S-152	0	400
TOTAL	1,890	3,490

*1,250 cfs is the maximum release with S-334 open.

**S-151 will be offline for construction activities

1.5 RELATED ENVIRONMENTAL DOCUMENTS

The Corps has documented a number of environmental documents relevant to the Proposed Action:

- *Planned Temporary Deviation to Affect Relief of High Water Levels Within Water Conservation Area 3A (WCA 3A), Broward and Miami Dade Counties, Florida Environmental Assessment and Finding of No Significant Impact.* U.S. Army Corps of Engineers, Jacksonville District, June 2017
- *General Design Memorandum and Environmental Impact Statement, Modified Water Deliveries to Everglades National Park,* U.S. Army Corps of Engineers, Jacksonville District, June 1992
- *C-111, Central and Southern Florida Project for Flood Control and Other Purposes, Final General Reevaluation Report and Environmental Impact Statement,* U.S. Army Corps of Engineers, Jacksonville District 1994
- *1998 Emergency Deviation from Test 7 of the Environmental Program of Water Deliveries to Everglades National Park to Protect the Cape Sable Seaside Sparrow, Central and Southern Florida Project for Flood Control and Other Purposes, Final Environmental Assessment,* U.S. Army Corps of Engineers, Jacksonville District, 1999
- *Jeopardy and Adverse Modification Biological Opinion on the Modified Water Delivery to Everglades National Park Experimental Program to Everglades National Park and Canal- 111 South Dade Projects,* U.S. Fish and Wildlife Service, Vero Beach, Florida 1999
- *Comprehensive Review Study of the Central and Southern Florida Project, Comprehensive Everglades Restoration Plan Final Integrated Feasibility Report and Programmatic Environmental Impact Statement ,* U.S. Army Corps of Engineers, Jacksonville District 1999
- *General Reevaluation Report and Final Supplemental Environmental Impact Statement, 8.5 Square Mile Area,* U.S. Army Corps of Engineers, Jacksonville District, July 2000
- *Central and Southern Florida Project for Flood Control and Other Purposes, Interim Structural and Operational Plan, Emergency Deviation from Test 7 of the Experimental Program of Water Deliveries to Everglades National Park for*

- *Protection of the Cape Sable Seaside Sparrow Final Environmental Assessment*, U.S. Army Corps of Engineers, Jacksonville District, 2000

- *Interim Operating Plan for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*, U.S. Army Corps of Engineers, Jacksonville District, 2002
- *Biological Opinion, Final Interim Operating Plan*, U.S. Fish and Wildlife Service, Vero Beach, Florida, November 17, 2006
- *Interim Operational Plan for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement*, U.S. Army Corps of Engineers, Jacksonville District, December 2006
- *C-111 Engineering Documentation Report*, U.S. Army Corps of Engineers, Jacksonville District, May 2007
- *Draft Environmental Assessment; Design Modifications for the Canal 111 Project*, U.S. Army Corps of Engineers, Jacksonville District, June 2007
- *Modified Water Deliveries to Everglades National Park Tamiami Trail Modifications Final Limited Reevaluation Report and Environmental Assessment*, U.S. Army Corps of Engineers, Jacksonville District, June 2008
- *Draft Environmental Assessment; Proposed Interim Operating Criteria for 8.5 Square Mile Area Project*, U.S. Army Corps of Engineers, Jacksonville District, November 2008
- *Revised Draft Environmental Assessment; Proposed Interim Operating Criteria for 8.5 Square Mile Area Project*, U.S. Army Corps of Engineers, Jacksonville District, April 2009
- *Canal-111 Spreader Canal Project Implementation Report*, U.S. Army Corps of Engineers, Jacksonville District, 2009
- *Biological Opinion, Canal-111 Spreader Canal*, U.S. Fish and Wildlife Service, Vero Beach, Florida, August 25, 2009
- *Biological Opinion, Everglades Restoration Transition Plan*, U.S. Fish and Wildlife Service, Vero Beach, Florida, November 17, 2010
- *Central and Southern Florida Project Comprehensive Everglades Restoration Plan C-111 Spreader Canal Western Project Final Integrated Project Implementation Report and Environmental Impact Statement*, U.S. Army Corps of Engineers, Jacksonville District, January 2011
- *Environmental Assessment; Proposed Interim Operation Criteria for 8.5 Square Mile Area Project*, U.S. Army Corps of Engineers, Jacksonville District, June 2011
- *Environmental Assessment; Design Refinement for the 8.5 Square Mile Area*, U.S. Army Corps of Engineers, Jacksonville District, August 2012
- *Environmental Assessment for Expansion of C-111 Detention Area and Associated Features South Miami-Dade County*, U.S. Army Corps of Engineers, Jacksonville District, May 2012
- *Everglades Restoration Transition Plan Final Environmental Impact Statement*, U.S. Army Corps of Engineers, Jacksonville District, October 19, 2012
- *Environmental Assessment; G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy*, U.S. Army Corps of Engineers, Jacksonville District, May 2015.
- *Environmental Assessment and Finding of No Significant Impact; Modifications to the C- 111 South Dade North and South Detention Areas and Associated Features*, U.S. Army Corps of Engineers, Jacksonville District, December 2016.
- *Environmental Assessment and Proposed Finding of No Significant Impact; Modifications to the C-111 South Dade Project, L-31W*, U.S. Army Corps of Engineers, Jacksonville District, July 2016.

- *Environmental Assessment; L-29 Canal and South Dade Conveyance System Temporary Emergency Deviation to Affect Relief of High Water Levels within Water Conservation Area 3A*, U.S. Army Corps of Engineers, Jacksonville District, February 2016
 - *Supplemental Environmental Assessment; L-29 Canal and South Dade Conveyance System Temporary Emergency Deviation to Alleviate High Water Levels in Water Conservation Area 3A*, U.S. Army Corps of Engineers, Jacksonville District, May 2016.
 - *Environmental Assessment Temporary Emergency Deviation to Alleviate High Water Levels in Water Conservation Area 3A (S-344 Deviation)*, U.S. Army Corps of Engineers, Jacksonville District, April 2016.
 - *Environmental Assessment and Finding of No Significant Impact: G-3273 Constraint Relaxation/S-356 Field Test and S-357N Revised Operational Strategy Increment 1 Plus (Increment 1.1 and 1.2)*, U.S. Army Corps of Engineers, Jacksonville District, April 2016. February 2017.
 - *Environmental Assessment and Finding of No Significant Impact, Planned Temporary Deviation from the 2012 Water Control Plan for Water Conservation Area 2A*, U.S. Army Corps of Engineers, Jacksonville District, July 2017.
 - *Environmental Assessment and Finding of No Significant Impact, Emergency Deviation to Affect Relief of High Water Levels within Water Conservation Area 3A and the South Dade Conveyance System Post Hurricane Irma and Planned Deviation to Affect Relief of High Water Levels within Water Conservation Area 3A*, U.S. Army Corps of Engineers, Jacksonville District, October 2017.
 - *Environmental Assessment and Finding of No Significant Impact, 2018: L-29 Canal and G-3273 Constraint Relaxation Including the Northern Detention area (Revised Operational Strategy Increment 2)*, U.S. Army Corps of Engineers, Jacksonville District, February 2018.
 - *Environmental Assessment and Finding of No Significant Impact, Planned Temporary Deviation from the 2012 Water Control Plan for Water Conservation Area 2A*, U.S. Army Corps of Engineers, Jacksonville District, June 2018.
-

Information contained within the previous NEPA documents listed above, as well as others described later, is incorporated by reference into this EA.

1.6 DECISIONS TO BE MADE

This EA will evaluate whether to initiate a planned temporary deviation to open the S-12A, S-12B, S-343A, S-343B and S-344 structures (hereafter referred to as the CSSS Closure Structures) on July 1, 2018, prior to their official opening date of July 15, 2018. This EA will document and evaluate alternatives to accomplish that goal. The No Action Alternative and other reasonable alternatives will be studied in detail to determine the Preferred Alternative.

1.7 SCOPING AND ISSUES

Please reference **Appendix B** for pertinent correspondence.

1.8 PERMITS, LICENSES, AND ENTITLEMENTS

This EA will be routed through the State of Florida Clearinghouse for Coastal Zone Management Act (CZMA) coordination, and early coordination has been initiated. The Corps has determined the Proposed Action is consistent to the maximum extent practicable with Florida's Coastal Management Program. The Florida State Clearinghouse concurred with this determination on June 20, 2018. The Proposed Action is not anticipated to adversely affect water quality and water quality certification is not necessary. On June 20, 2018, the Florida Department of Environmental Protection (FDEP) issued an Emergency Final Order (EFO; OGC No.: 18-1066) in response to high rainfall and flooding in the South Florida Region. The EFO states that the Corps and SFWMD are hereby authorized to make temporary operational changes in order to minimize detrimental impacts to the environment, to the public, to adjacent properties, and to downstream receiving water. The FDEP EFO waives the requirement for state water quality certification for this Federal Action. The EFO expires November 30, 2018.

2.1 PROPOSED ACTION AND ALTERNATIVES

Each of the following alternatives described below were considered and evaluated against the project purpose and need and associated environmental impacts were considered.

Alternative A (No Action Alternative): The No Action Alternative would continue current C&SF Project water management operations as defined in MWD Increment 1 Plus and MWD Increment 2, which are deviations to the 2012 Water Control Plan.

Alternative B (Relaxation of the L-29 Canal Constraint): Alternative B relaxes the current 7.5 feet National Geodetic Vertical Datum (NGVD) of 1929 maximum operating limit in the L-29 Canal up to 8.5 feet NGVD. In addition, under Alternative B, the CSSS Closures Structures would remain closed through July 14, 2018.

Alternative C (Early opening of CSSS Closures Structures): Alternative C includes early opening of the CSSS Closure Structures (i.e. S-12A, S-12B, S-343A, S-343B and S-344). In accordance with the 2016 Everglades Restoration Transition Plan (ERTP) Biological Opinion (BO) under MWD Increment 1 Plus and MWD Increment 2, the CSSS Closure Structures are closed through July 14 annually to protect the endangered CSSS. Under Alternative C, one, all or any combination of these structures would open on July 1, 2018 prior to their official opening date of July 15, 2018, pending consultation with the U.S. Fish and Wildlife Service. The deviations, if implemented, are expected to continue until July 15, 2018.

2.2 ISSUES AND BASIS FOR CHOICE

This planned temporary deviation is envisioned to reduce water stages within WCA 3A to the extent practicable given the current infrastructure as well as downstream system constraints to include on-going construction, flood mitigation and environmental considerations including threatened and endangered species. The alternatives described in **Section 2.0** were formulated, considered and evaluated based on the achievement of project purpose and need and compliance with project constraints

(**Section 1.3**). Potential effects on the human environment were also evaluated (**Section 4.0**).

Alternative A, the No Action Alternative, would maintain operations as identified within the 2012 Water Control Plan, MWD Increment 1 Plus and MWD Increment 2 operational strategies. Current operations are not sufficient to significantly reduce stages within WCA 3A and further operational flexibility is required in order to reduce outflow constraints within WCA 3A given the current and future projected conditions. Alternative A does not meet the project purpose and need as described in **Section 1.3**.

Alternative B includes raising the maximum operating limit constraint within the L-29 Canal up to 8.5 feet NGVD as per the MWD Increment 2 (USACE 2018) prior to July 1, 2018. Alternative B would provide significant benefits to WCA 3A by reducing stages, however, implementation of Alternative B would also pose serious and irrecoverable risks to on-going construction contracts within C-111 South Dade Project construction footprint. Critical components of the C-111 South Dade Project are anticipated to be completed around June 30, 2018. Once those critical components are completed and

accepted by the Corps, the Corps plans to incrementally raise stages within the L-29 Canal in accordance with MWD Increment 2. This additional flexibility will also act to reduce high water concerns within WCA 3A.

Alternative C allows for operational flexibility to remove water directly from WCA-3A through the use of the CSSS Closure Structures prior to their scheduled opening date of July 15, 2018. These structures are all direct outlets from WCA 3A, thereby, providing a significant benefit to directly reduce stages within WCA 3A. Currently, between all three WCAs there is approximately 908,725 acre-feet (**Table 2**) of excess water above schedule. Opening these structures will contribute approximately 1,200 cfs extra flow out of WCA-3A (63 percent increase), or an extra 3,500 ac-ft per day during the deviation period. The CSSS Closure Structures are all closed until July 15 annually for protection of the endangered CSSS as outlined within the July 22, 2016, U.S. Fish and Wildlife Service (USFWS) ERTTP BO. In that BO, USFWS determined that unless alternatives to current water operational practices are explored and implemented, continued implementation of ERTTP is likely to jeopardize the continued existence of the CSSS. The July 22, 2016 ERTTP BO presented a Reasonable and Prudent Alternative (RPA) that would avoid jeopardizing the CSSS. The RPA identified operational modifications and expediting restoration initiatives for some of the structures in the southern portion of the Everglades ecosystem to provide suitable nesting habitat for the endangered CSSS. One main element of the RPA was additional seasonal closures to outlet structures within WCA 3A (*i.e.* S-12A, S-12B, S-343A, S-343B, S-344), with the flexibility to open under high water conditions between October and November. The July 15 open date for these structures was retained from the previous 2002, 2006, and 2012 USFWS BOs.

The 2016 ERTTP BO also included hydrological targets to include 90 dry days for at least 24,000 acres within and adjacent to CSSS Sub-population A (CSSS-Ax) habitat during the CSSS nesting season defined as March 1 through July 15. It is important to note that the Corps has not met the 2016 ERTTP BO nesting window target during the 2018 CSSS breeding season with CSSS-Ax. The EDEN Sparrow Viewer indicates that less than 9.4% of CSSS-Ax habitat is available for breeding as of June 22, 2018. The SFWMD position analysis projections for stage levels at NP-205, located in the northeast quadrant of the CSSS-Ax habitat, indicates a zero percent probability of water stages receding below ground for the remainder of the 2018 wet season, based on the historical simulated rainfall period. Furthermore, there is a 5% probability water stages will recede below ground by mid-December and a 50% probability water stages will recede below ground by early March 2019 under the current operational criteria for the WCAs. Considering these probabilities, additional flows are not likely to cause any significant additional inundation to CSSS nesting areas prior to July 15.

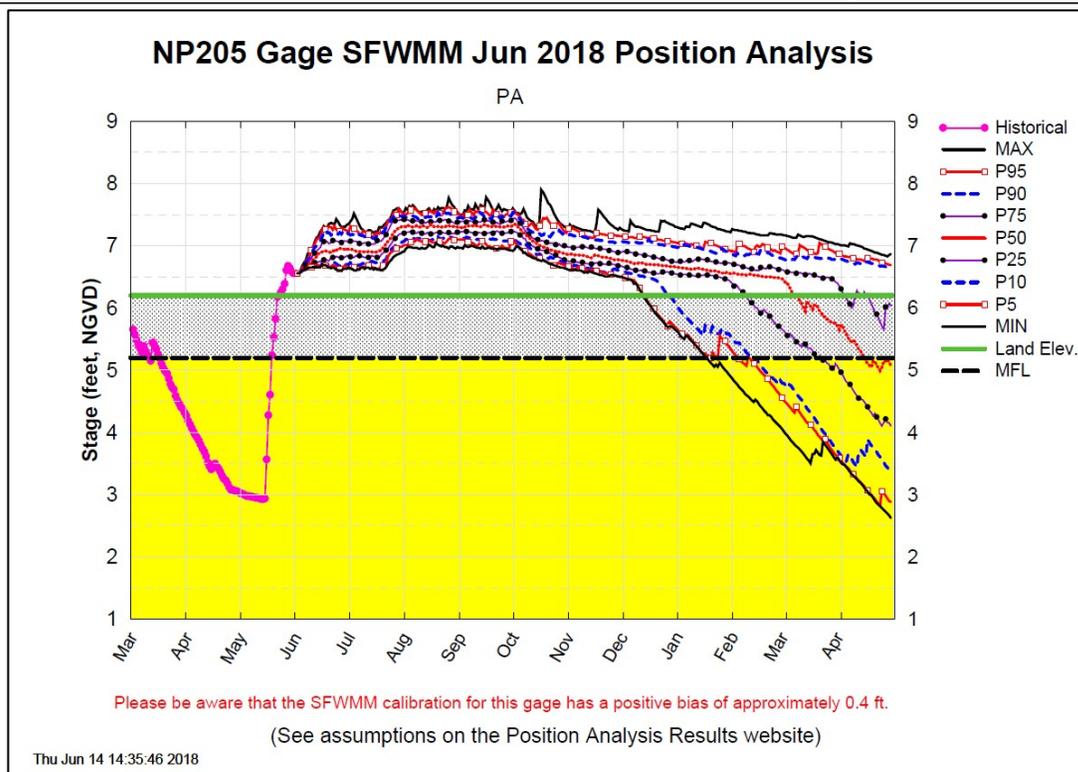


FIGURE 8: NP-205 GAGE SFWMM JUNE 1, 2018 DYNAMIC POSITION ANALYSIS

The Corps has currently maximized outflows from WCA 3A as well as limited inflows to the extent practicable given conditions within the upstream basins. Other steps the Corps is implementing to reduce stages in WCA 3A include maximizing discharge to the extent possible through S-12C, S-12D, S-333 and S-334 and maximizing discharges to tide from each of the WCAs. In addition, the Corps plans to implement a deviation with WCA 2A through April 30, 2019. The purpose of that deviation is to hold stages higher in WCA 2A in order to reduce outflows from the S-1 structures into WCA 3A. The Corps documented this deviation in a 2018 EA/FONSI.

The Corps recognizes the commitments made within the 2016 ERTF BO and remains committed to implementation of the RPA. One such commitment is to complete construction of the C-111 South Dade and 8.5 Square Mile Area (SMA) construction projects. Completion of these critical construction components will allow implementation of the 2016 BO RPA to include the MWD Increment 2 and the Combined Operations Plan in accordance with the schedule identified in the 2016 ERTF BO RPA and further coordinated with USFWS. In order to facilitate ongoing construction efforts through July 2018 to the maximum extent practicable, the Corps will maintain water elevations within the C-111 South Dade construction footprint at or below stage levels corresponding to the MWD Increment 1 Plus (Increment 1.2) maximum operating limit of 7.8 feet NGVD in the L-29 Canal. In light of this constraint, the remaining options to further reduce stages within WCA 3A are to remove the seasonal closure constraints on the CSSS Closure Structures. At current release rates for S-12C, S-12D, and S-333 and assuming full releases from the CSSS Closure Structures, it will take approximately seven months to remove the excess water currently being held in all three WCAs (based upon SFWMD Position Analysis P50; refer to **Figure**

7).

Based upon the effects analysis conducted within this EA, Alternative C is the Preferred Alternative. This plan is expected to best meet the project purpose and need while minimizing any negative effects. Alternative C best utilizes current capacity and existing structures within the C&SF Project to increase water deliveries from WCA 3A to ENP. Immediate action is necessary to remove water from WCA 3A.

2.3 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

Alternative B (Relaxation of the L-29 Canal Constraint) was eliminated from detailed evaluation. The rationale for the elimination of this alternative was due to inclusion of relaxation of the L-29 Canal and lessons learned from the 2016 Emergency Deviations (USACE 2016) and 2017 Emergency Deviation (USACE 2017).

Due to the very strong El Niño during the 2015 to 2016 dry season, WCA 3A experienced unseasonable high water levels. The first half of the dry season (November 2015-January 2016) was the wettest for this period since record keeping began in 1932. To protect natural resources within WCA 3A in correspondence dated February 11, 2016, the Governor of Florida requested that the Corps take immediate action to relieve flooding of the Everglades WCAs by raising the level of the L-29 Canal to 8.5 feet, NGVD so that substantial volumes of water could be moved from WCA 3A to ENP through Shark River Slough (SRS). The Corps initiated a temporary emergency deviation to the stage maximum operating limit of 7.5 feet, NGVD in the L-29 Canal on February 15, 2016 at the request of the Governor, for purposes of providing high water relief in WCA 3A. The 2016 Temporary Emergency Deviation also included other operational changes needed to mediate any concern with increased seepage from ENP into the SDCS. The Corps approved the SFWMD request for additional operational flexibility to increase WCA 3A discharge by raising the L-29 constraint up to 8.5 feet, NGVD with corresponding lowering of the 8.5 SMA L-31N, and C-111 Canals to compensate for the resulting higher stages and increased groundwater seepage along the eastern boundary of ENP and further expanded utilization of Column 2 operations to convey WCA 3A releases to the SDCS.

Residents within the 8.5 SMA expressed concern during implementation of the 2016 Temporary Emergency Deviation due to observed increases in ground and surface water. In response to these concerns, the SFWMD constructed temporary measures including the use of temporary pumps and an open channel connection between the C-358 Canal and the C-357 Canal prior to construction of S-357N to maintain flood mitigation requirements for the 8.5 SMA; the S-357N is a gated control structure that will connect the C-358 Seepage collection canal to the existing C-357 Canal, upstream of S-357 within 8.5 SMA. The SFWMD also constructed temporary plugs in the drainage swales located north and south of Richmond Drive (SW 168th Street), and a berm around

the western end of the C-358 Canal (**Section 1.3.2** of the MWD Increment 1 Plus EA). Design refinements associated with the C-111 South Dade Project include the extension of the L-357 W Levee from the 8.5 SMA Detention Cell to the southern limits of Richmond Drive and the completion of the remaining levee segment to cross Richmond Drive, including construction of a ramp over the new levee segment to maintain western access to ENP, as currently anticipated under Contract 8 and Contract 8A of the C-111 South Dade Project. The temporary plugs were constructed to help decrease potential increases in groundwater stages adjacent to the existing LPG-1 groundwater monitoring gauge, which is located to the north of Richmond Drive between SW 213th Avenue and the L-357 W Levee alignment, in the absence of the completion of the L-357W extension (USACE 2017).

During the 2016 Temporary Emergency Deviation, the SFWMD also installed temporary culverts in the southern levee of the 8.5 SMA Detention Cell in an area where the planned degrading of the S-360W weir will take place to connect the 8.5 SMA Detention Cell to the future C-111 South Dade Northern Detention Area, as currently anticipated under modifications to the C-111 South Dade Project (USACE 2016a). This effort was undertaken by the SFWMD in order to limit the increase in water depth in the 8.5 SMA Detention Cell that may be associated with the additional S-357 pumping coincident with the connection of the C-358 Canal to the C-357 Canal. By not allowing significant water storage depths within the 8.5 SMA Detention Cell, the potential for backwater drainage effects on the southwest corner of the 8.5 SMA (LPG-1 Gage) caused by retardation of the regional groundwater flow to the southeast is reduced.

During the 2016 Temporary Emergency Deviation, temporary flowage authorizations from private land owners along the L-29 Canal were obtained by the SFWMD allowing maximum stages of 8.5 feet, NGVD. With some improvements made by the SFWMD during the 2016 Temporary Emergency Deviation, sustained stages over 8.0 feet, NGVD were implementable during the period covered by the temporary flowage authorizations. Additional existing constraints at the remaining private ownerships along the L-29 Canal limited the peak operating stage during the 2016 Temporary Emergency Deviation to about 8.3 feet NGVD. These parcels have since been acquired by the Department of the Interior, including flowage easements needed to allow the Corps to flow water across these proprietries.

As identified within the MWD Increment 1 Plus EA and MWD Increment 2 EA, raising of the L-29 Canal maximum operating limit above 7.5 feet NGVD up to 7.8 feet NGVD is contingent upon compliance with all of the following conditions: (1) acquisition of required real estate interest and any associated improvements for the private ownership along Tamiami Trail including receipt of Tamiami Trail Bridge and roadway channel and flowage easements from the Florida Department of Transportation; (2) completion of the C-358 Canal (Richmond Drive Seepage Collection Canal) and installation of S-357N (C-358 control structure); (3) completion of sufficient portions of Contracts 8 (construction of the C-111 NDA L-315 western levee and the L-357W Extension Levee between Richmond Drive and the 8.5 SMA Detention Cell) and completion of the Contract 8A berms inside the 8.5 SMA Detention Cell. To date the contingencies for (3) have not been completed, therefore, Alternative B was eliminated from detailed evaluation. Based on the current projected construction schedule, the remaining segments of the L-315

western levee will be complete by June 30, 2018.

Another reason for elimination of Alternative B is the 2016 ERTTP BO. A BO states the opinion of the USFWS as to whether a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat. USFWS issued a new BO for ERTTP on July 22, 2016, developed in formal ESA consultation with the Corps. As a result of this consultation, USFWS determined that current conditions within endangered CSSS habitat (CSSS-Ax), threaten the survival of the CSSS, and as a result, USFWS issued a “jeopardy” opinion, which explains that unless alternatives to current water operational practices are explored and implemented, continued implementation of ERTTP is likely to jeopardize the continued existence of the CSSS. The revised BO presented a RPA that would avoid jeopardizing the CSSS. The RPA identified operational modifications and expediting restoration initiatives for some of the structures in the southern portion of the Everglades ecosystem to provide suitable nesting habitat for the endangered CSSS. Main elements of the RPA are: habitat performance targets; actions to move water east; surveys and studies; and adaptive management. These RPA actions include additional seasonal closures to outlet structures within WCA 3A (*i.e.* S-12A, S-12B, S-343A, S-343B, S-344), with the flexibility to open under high water conditions between October and November, and adjustments in operations in the SDCS that will enable additional flows to Biscayne Bay during the dry season and increased flows toward eastern ENP to extend hydroperiods during the early dry season.

In response to the 2016 ERTTP BO, the Corps committed to taking specific actions to comply with the BO terms and conditions and implementing the RPA. One such action to move water east is to raise the L-29 Canal stage up to 8.5 feet NGVD. MWD Increment 2 is the action that will allow this operational change and, in accordance with the 2016 ERTTP BO RPA, NEPA was completed prior to March 1, 2018, in accordance with the RPA requirements. However, in order to implement this action, the Corps will need to complete construction of the C-111 South Dade Northern Detention Area (NDA; Contracts 8 and portions of Contract 8A), along with completing construction of the 8.5 SMA Project. In order to complete these critical construction features for the NDA that are scheduled for completion by June 30, 2018, no discharges from the 8.5 SMA Detention Cell into the interior portion of the NDA construction footprint may be allowed. In order to facilitate construction completion, including the hydraulic connection between the 8.5 SMA Detention Cell and the NDA, the L-29 maximum canal limit during this period must not be raised above 7.5 feet NGVD. Delayed completion of the in-progress C-111 South Dade Contract 8 and Contract 8A construction efforts may preclude completion of the NDA. Operation of the NDA to receive 8.5 SMA flood mitigation discharges from the S-357 pump station is a prerequisite for raising the L-29 Canal maximum operating limit from 7.8 feet NGVD up to 8.5 feet NGVD under MWD Increment 2. Based on the current incomplete status of the C-111 NDA construction and the critical need to complete C-111 South Dade construction in order to fully realize long-term benefits from operational changes associated with MWD Increment 2 and the future Combined Operational Plan, Alternative B was eliminated from detailed evaluation.

2.4 PREFERRED ALTERNATIVE

Based upon the effects analysis conducted within this EA, Alternative C is the Preferred Alternative. This plan is expected to best meet the project purpose and need identified in **Section 1.3**. Summary details of the Preferred Alternative are listed below:

- Open S-12A, S-12B, S-343A, S-343B and S-344 on July 1, 2018 prior to official opening date of July 15, 2018, pending consultation with the USFWS. Any one, all or a combination of the structures may be opened on July 1, 2018 pending USFWS consultation under this alternative.
- This deviation, if implemented, is expected to continue until July 15, 2018.

3.1 AFFECTED ENVIRONMENT

3.2 GENERAL ENVIRONMENTAL SETTING

The remaining portion of the Greater Everglades wetlands includes a mosaic of interconnected freshwater wetlands and estuaries located primarily south of the EAA. A ridge and slough system of patterned, freshwater peat lands extends throughout the WCAs into Shark River Slough (SRS) in ENP. The ridge and slough wetlands drain into tidal rivers that flow through mangrove estuaries into the Gulf of Mexico. Higher elevation wetlands that flank either side of SRS are characterized by marl substrates and exposed limestone bedrock. Those wetland areas located to the east of SRS include the drainage basin for Taylor Slough, which flows through an estuary of dwarf mangrove forests into northeast Florida Bay. The Everglades wetlands merge with the forested wetlands of Big Cypress National Preserve (BCNP) to the west of WCA 3.

Declines in ecological function of the Everglades have been well documented. Construction of canals and levees by the C&SF Project has resulted in the creation of artificial impoundments and has altered hydroperiods and depths within the project area. The result has been substantially altered plant community structures, reduced abundance and diversity of animals and spread of non- native vegetation.

3.3 CLIMATE

The climate of South Florida is subtropical. Seasonal rainfall patterns in South Florida resemble the wet and dry season patterns of the humid tropics more than the winter and summer patterns of temperate latitudes. Of the 53 inches of rain that South Florida receives on average annually, 75% falls during the wet season months of May through October. Tropical storms and hurricanes also provide major contributions to wet season rainfall. During the dry season (November through April), rainfall is governed by large-scale winter weather fronts that pass through the region approximately weekly. However, due to the variability of climate patterns (La Niña and El Niño), dry periods may occur during the wet season and wet periods may occur during the dry season. High evapotranspiration rates in South Florida roughly equal annual precipitation. Mean annual temperature for the South Florida ecosystem ranges from 72 ° Fahrenheit (F) (22 ° Celsius [C]) in the northern Everglades to 76 ° F (24 ° C) in the southern Everglades (Thomas 1974). There is now evidence of anthropogenic changes to global climate patterns that will likely have an impact on South Florida in terms of rainfall, evapotranspiration, and temperature.

3.4 GEOLOGY AND SOILS

The geology and soils of South Florida represent many of the opportunities, constraints, and impacts of regional water management. The high transmissivity of the Biscayne Aquifer allows rapid recharge of lower east coast well fields while it sets the stage for water competition between the Everglades and Biscayne Bay regarding the issue of seepage control. The loss of peat soils of the Everglades provides an indicator of ecosystem change due to drainage activities. Peat soils predominate in previously flooded areas. Peat soils have subsided as a result of oxidation due to drainage, which has affected local topography and hydroperiods.

The lower east coast on the Atlantic Coastal Ridge is mostly underlain by thin sand and Miami Limestone that are highly permeable and moderately to well-drained. To the west of the coastal ridge, soils of the lower east coast contain fine sand and loamy material and have poor drainage. Rockland areas on the coastal ridge in Miami-Dade County are characterized by weathered limestone surfaces and karst features such as solution holes and sinkholes. Higher elevation marshes of the southern Everglades on either side of SRS are characterized by calcitic marl soils deposited by calcareous algal mats and exposed lime rock surfaces with karst features such as solution pits and sinkholes.

3.5 STUDY AREA LAND USE

The existing land use within the study area varies widely from agricultural to high-density multi-family and industrial urban uses. Much of the land use/cover change occurring in South Florida over the past several years can be categorized as either the creation of new developments in previously natural or agricultural areas, or the change in the types of agriculture practiced. Generally, urban development is concentrated along the Lower East Coast (LEC) from Palm Beach County to Miami-Dade County. WCA 3, located directly north of ENP, is part of the Everglades Complex of Wildlife Management Areas and are managed by the Florida Fish and Wildlife Conservation Commission (FWC).

3.6 HYDROLOGY

The major characteristics of South Florida's hydrology are: (1) local rainfall;(2) evapotranspiration; (3) canals and water control structures; (4) flat topography; (5) the highly permeable surficial aquifer along a thirty to forty mile-wide coastal strip. Local rainfall is the source of all of South Florida's fresh water. The surface water that is not removed from the land by evapotranspiration and seepage to the underlying aquifer is drained to the Atlantic Ocean, Florida Bay, or the Gulf of Mexico by very slow, shallow sheetflow through wetlands or relatively quickly through man-made canals.

Levees and canals constructed during the last 60 years under the C&SF Project have divided the former Everglades into areas designated for development and areas for fish and wildlife benefits, natural system preservation, and water storage. The natural areas consist of the three WCAs located north of Tamiami Trail. ENP is located south of Tamiami Trail. The WCAs provide detention storage for water from Lake Okeechobee, the EAA, and parts of the east coast region. Detention of water helps prevent floodwaters from inundating the east coast urban areas; provides water supply and detention for east coast urban and agricultural areas and ENP; improves the water supply for east coast communities by recharging underground freshwater reservoirs; reduces seepage; and provides control for saltwater intrusion in coastal aquifers. While the WCAs may reduce the severity of the drainage of the Everglades caused by the major canal systems, thus reducing impacts to fish and wildlife caused by the major drainage systems, the levees surrounding the WCAs still function to impound the Everglades, precluding the historic flow patterns. The C&SF Project infrastructure, combined with operational constraints, makes it difficult to provide natural timing, volume and distribution. In wet periods, water is impounded in the WCAs and then discharged to ENP or coastal canals for eventual release to tide. During dry periods, water can flow through the canals to coastal areas and bypass the ENP wetlands.

WATER CONSERVATION AREAS 3A AND 3B

The largest WCA is WCA 3, which is divided into two parts, 3A and 3B. It is approximately 40 miles long from north to south and covers approximately 915 square miles. Ground elevations slope southeasterly one to three feet in ten miles ranging from 13 feet NGVD in northwest WCA 3A to six feet, NGVD in southeast WCA 3B. The area is enclosed by approximately 111 miles of levees, of which 15 miles are common to WCA 2. An interior levee system across the southeastern corner of the area reduces seepage into an extremely pervious aquifer.

The upper pool, WCA 3A, provides an area of approximately 752 square miles for storage of excess water from the following sources: regulatory releases from WCA 2A; rainfall excess from approximately 750 square miles in Collier and Hendry counties (through Mullet Slough); flood control inflows from 71 square miles of the former Davie agricultural area lying east of pump station S-9 in Broward County; and excess water from a 208 square mile agricultural drainage area of the Miami Canal and other adjacent EAA areas to the north. WCA 3A provides water supply to the LEC, as well as the SDCS, in accordance with the WCA 3A Regulation Schedule, and WCA 3A provides water deliveries to ENP in accordance with the Rainfall Formula and the WCA 3A Regulation Schedule, collectively referred to as the Rainfall Plan (USACE 2006). Due to its limited discharge capacity compared to the spatial extent of the watershed from which it receives water, consecutive rainfall events have the potential to quickly utilize potential storage within WCA 3A and result in discharges from WCA 3A to SRS and/or the SDCS via the S-12 structures and/or S-333 and S-334.

South of WCA 3 and within ENP, the northern portion of SRS is also partially divided by the remaining 5.5 miles of the L-67 Extension Levee, which extends south from the southern terminus of L-67A at Tamiami Trail. Outflows from WCA 3A to ENP are regulated according to the WCA 3A Regulation Schedule, with some additional WCA 3A outflows to ENP from groundwater seepage across Tamiami Trail and seasonal surface water flows through the L-28 gaps, which then continue south along the L-28 borrow canal towards the Tamiami Trail bridges west of S-12A.

Stage variability within WCA 3 typically follows an annual cycle; the levels vary from high stages in the late fall and early winter to low stages at the beginning of the wet season (typically late May or early June). Water stages within WCA 3A typically exceed the top of the WCA 3A Regulation Schedule during the months of August through October, with this duration extended to earlier in the wet season (May) and/or later into the dry season during wet years (November and December). Above-normal rainfall patterns associated with El Niño conditions during the dry season months (November through May) may also result in water stages which exceed the top of the Regulation.

Schedule. Overall, water stage decreases from northwest to southeast within WCA 3, consistent with the general direction of surface water flow and prevailing topography within WCA 3. Water depth is typically between one to two and a half feet, with the shallower waters in the higher elevation northwestern portion of WCA 3. Water stages and depths in WCA 3B are typically much lower than water stages and depths in WCA 3A, due to limited surface water inflows into WCA 3B and the reduction of seepage from WCA 3A to WCA 3B consistent with the design purpose of the L-67A and L-67C levees.

Water levels in WCA 3B are affected by seepage losses to the east towards the L-30 borrow canal and seepage losses to the south towards the L-29 Canal.

Water supply deliveries from the C&SF Project (also known as the Regional system) to coastal canals are utilized to recharge coastal well fields and to prevent saltwater intrusion into the Biscayne aquifer. When canal levels drop below adequate recharge levels due to a combination of well field drawdowns, evaporation, and lack of rainfall, water supply deliveries are typically made from the Regional system. When canal levels drop in Miami-Dade County, regional water supply is delivered from WCA 3A through one of two delivery routes. Depending on system conditions, both routes may be utilized concurrently. For the northern delivery route from WCA 3A, water supply deliveries are either released from S-151 to the Miami Canal within WCA 3B (C-304), followed by downstream releases to either Miami-Dade County's SDCS by utilizing S-337 and/or by utilizing S-31 to release into the C-6 Canal. For the southern delivery route from WCA 3A, water supply deliveries are released from S-333 (from the upstream L-67A Canal), passed through the L-29 Canal, and are released to the SDCS by utilizing S-334.

The most important component of the groundwater system within the study area is the Biscayne aquifer, an unconfined aquifer unit underlying an area of approximately 3,000 square miles in southeast Florida, from southern Palm Beach County southward through Broward County to South Miami-Dade County. Groundwater in WCA 3 generally flows from the northwest to the southeast, with extensive seepage across the eastern and southern levees, L-30 (southeast corner of WCA 3B) in particular. However, the direction of groundwater flow may be locally influenced by rainfall, drainage canals, or well fields. Fluctuations in groundwater levels are seasonal. Groundwater levels within WCA 3 are influenced by water levels in adjacent canals. Where there is no impermeable formation above the aquifer, surface water recharges the system and the groundwater level can rise freely. In times of heavy rainfall, the aquifer fills and the water table rises above the land surface, contributing to seasonal inundation patterns throughout the area.

NORTHEAST SHARK RIVER SLOUGH

Northeast Shark River Slough (NESRS) is a complex area located in the northeast corner of ENP. It is currently the northern terminus of SRS, which is aligned from the northeast to southwest across ENP. Tamiami Trail is the northern boundary, the L-31N Canal the eastern boundary, and the L-67 Extension Canal the western boundary of the NESRS. Prior to construction and operation of the C&SF Project, NESRS would have been characterized as wet most of the year, but regional developments have impacted historic freshwater routes into the area. In addition, if historic levels are not maintained through the end of the wet season, significant reductions in surface water can occur during the dry season below historic dry season levels.

Water enters NESRS primarily from WCA 3A via S-333, and then to the L-29 Borrow Canal and subsequent passage through several sets of culverts and the one-mile Tamiami Trail bridge (completed as part of the MWD Project in 2013) under Tamiami Trail. S-355A and S-355B may also be used to deliver water from WCA 3B to the L-29 Canal for subsequent passage through the culverts to NESRS. The discharges made from WCA 3A through the S-12 structures and S-333 are target flows determined from the Rainfall Plan (USACE 2012a). Under the Rainfall Plan in the 2012 Water Control

Plan, water deliveries would be computed and operations adjusted weekly, if necessary based on the sum of two components: a rainfall response component and a WCA 3A regulatory component. The normal operational target flow distribution is 55% through the S-333 into NESRS and 45% through the S-12 structures into ENP west of the L-67 Extension. Eastern portions of the ENP are also influenced by the system of canals and structures that provide flood control and water supply for the LEC urban and agricultural areas. The operational intent of the Rainfall Plan under the 2012 Water Control Plan and the MWD field tests (Increment 1.1 and 1.2, and Increment 2) is to maximize discharge capacity from S-333 prior to utilization of the S-12s. The Rainfall Plan target distribution through S-333 may exceed 55% of the Rainfall Plan target. Additional details for the Rainfall Plan are provided in Section 3.6.

WESTERN SHARK RIVER SLOUGH

Western SRS located to the west of L-67 Extension Levee and bounded on the north by Tamiami Trail, is primarily influenced by rainfall and water management operations at the S-12 structures (A, B, C and D). Under the 2012 Water Control Plan, the utilization of the S-12 structures and the seasonal sequential closure periods beginning from the west at S-12A (November 1 through July 15) and S-12B (January 1 through July 15) is meant to move water from WCA 3A into SRS while providing conditions for Cape Sable seaside sparrow Subpopulation-A (CSSS-A) nesting and breeding. The seasonal closures window for S-12A and S-12B was expanded to initiate on October 01 beginning with the Increment 1.1 and Increment 1.2 field test, except under prescribed high water conditions within WCA 3A. Releases from WCA 3A are specified by the Rainfall Plan, which includes the regulation schedule for WCA 3A and the Rainfall Formula. This Rainfall Based Management Plan consists of a rainfall-based delivery target and a supplemental regulatory component that specifies the total amount of water to be delivered to ENP in weekly volumes through the S-333 and S-12 structures. The operational intent of the Rainfall Plan under the 2012 Water Control Plan and the MWD field tests is to maximize discharge capacity from S-333 prior to utilization of the S-12s. When S-12s capacity is required the structure should be opened from east to west. Additional details for the Rainfall Plan are provided in Section 3.6.

TAYLOR SLOUGH

Taylor Slough is in the southeast quadrant of ENP. The area through the Rocky Glades and Taylor Slough is higher in elevation compared to ground levels north, south, or west. Because of this characteristic, the area is normally drier than other areas in the ENP. The Rocky Glades and Taylor Slough are somewhat like an island or a peninsula extending from the canals into the ENP. Under ERTTP, specified C-111 basin canal water levels/ranges and S-332D pump station operations have resulted in Taylor Slough being provided water from the C-111 Basin mainly during the wet season. During the dry season, under ERTTP, water deliveries to Taylor Slough were limited to provide conditions conducive to CSSS Sub-population C nesting (325 cfs from December 1 – January 31; 250 cfs from February 1 – July 14).

Since completion of the S-332D Detention Area in 2003, maximum surface water flows observed at the Taylor Slough Bridge (approximately 1.8 miles downstream of the existing L-31W gap and the remnant S-332/S-332I pump stations) typically range between 250 and 550 cfs during the wet season months of June to October. The flow at Taylor Slough includes contributions from the S- 332D Detention Area and flow-way, southerly flow within the remnant L-31W Canal (including significant seepage inflows from the S-332D Detention Area), and drainage from the adjacent ENP wetlands. The S-332D Detention Area includes the High Head Cell (a portion of the S-327 weir was degraded by SFWMD in August 2016, as part of the C-111 South Dade Project), the Cell 1 detention area, the Cell 2 detention area, and the flow-way cell. **Figure 9** and **Figure 10** provide an overview of the S-332D Detention Area and the northern reaches of the L-31W Canal, including prevalent surface water flow pathways (indicated by green arrows) and seepage/groundwater flow pathways (indicated by blue arrows). Recently completed backfill and/or plugs within the remnant segments of the L-31W Canal will reduce seepage losses from the S-332D Detention Area to the L-31W Canal, reduce drainage of the adjacent ENP wetlands by the L-31W Canal, and promote increased sheetflow to Taylor Slough.

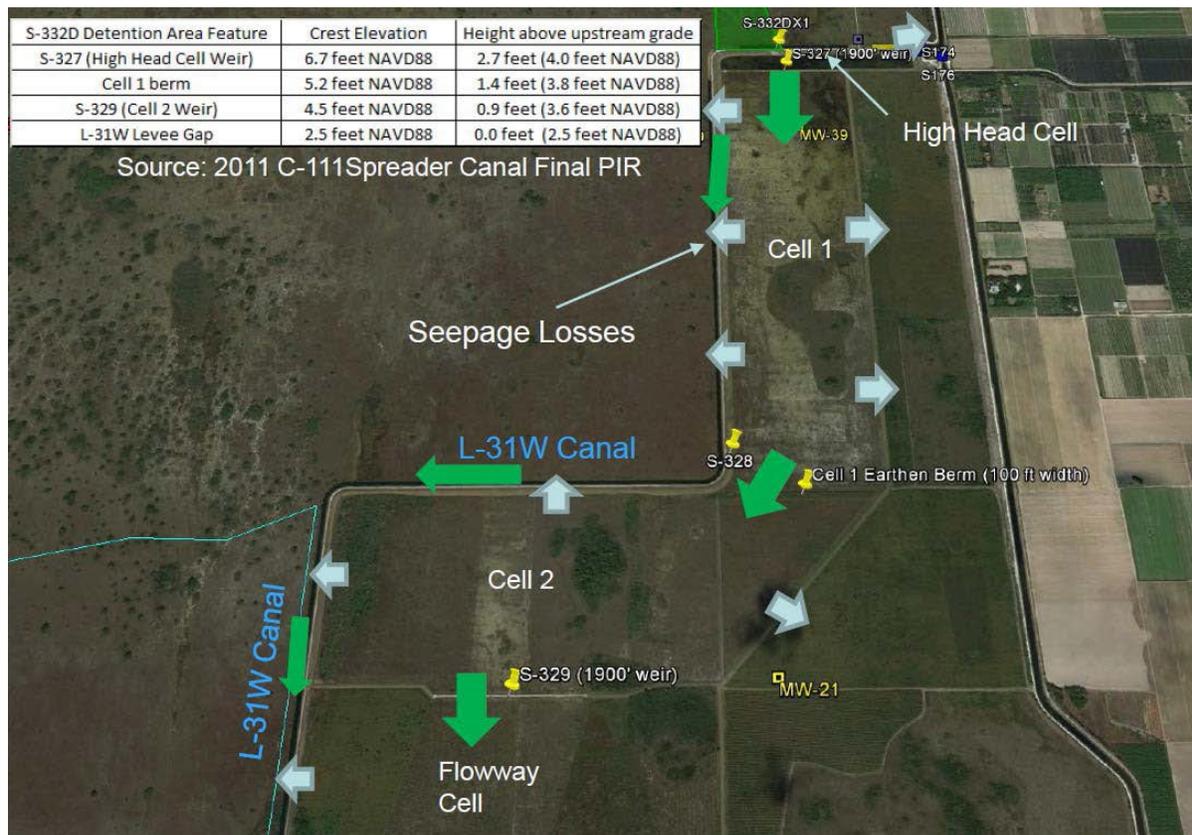


FIGURE 9. NORTHERN S-332D DETENTION AREA.

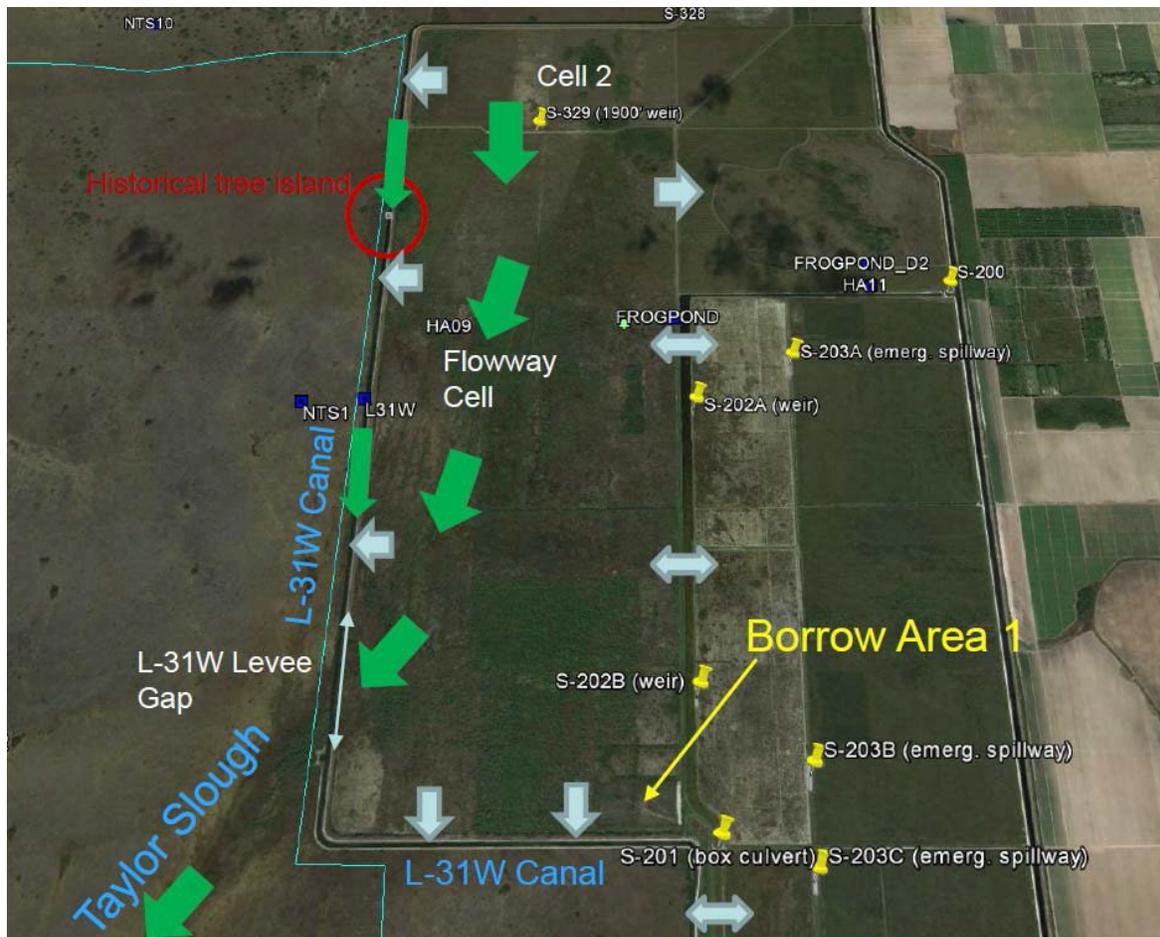


FIGURE 10. SOUTHERN S 332D DETENTION AREA

LOWER EAST COAST AREA

The LEC area is located to the east of the L-31N, L-31W, and C-111 canals. Under the 2012 Water Control Plan and the ongoing MWD field test planned deviations, specified canal water levels/ranges are meant to provide flood protection, water supply, and prevention of saltwater intrusion for the LEC. The LEC can be provided water supply from WCA 3A and Lake Okeechobee according to their respective regulation schedules. In wet conditions, the excess water from the LEC is discharged to tide.

8.5 SQUARE MILE AREA

The 8.5 SMA is a primarily residential area adjacent to, but west of, the L-31N Canal. The 8.5 SMA, which is also known as the Las Palmas community, is bordered on both the west and north by NESRS. The community has water management infrastructure consisting of a perimeter levee, a seepage collection canal, a pump station (S-357), and a southern detention area meant to collectively provide flood mitigation as part of the MWD Project (USACE 2000). An additional seepage collection canal and gated water control structure (S-357N) were completed in 2018 along the southern boundary of the 8.5 SMA (along Richmond Drive) as part of the MWD Project.

The 8.5 SMA, when fully constructed and operational, will provide mitigation for the increased water levels that will occur once the MWD project is fully implemented and the associated MWD additional water flows are delivered to ENP. The 8.5 SMA flood mitigation features do not work independently, as full mitigation is dependent on both the MWD 8.5 SMA features and the C-111 South Dade project features. The MWD project and the C-111 South Dade project work together, and more water deliveries (out of WCA 3A and into the ENP) cannot occur without adversely impacting private property within the 8.5 SMA until the C-111 South Dade NDA is constructed, operational, and connected to the 8.5 SMA Detention Cell. The hydraulic connection between the 8.5 SMA and the NDA, which was envisioned by the 2000 MWD GRR/EIS for the 8.5 SMA, creates an interdependency between MWD and C-111SD project operations which affects the flood mitigation performance for the MWD 8.5 SMA components, the flood protection performance of the C-111SD project components, and the hydrologic/ecological benefits for both the MWD and C-111SD projects. Completion of NDA components and the levee components adjacent to the 8.5 SMA included in the C-111 South Dade ongoing construction contracts is integral to allowing more water to flow south into the ENP, and to ensure the 8.5 SMA features provide the flood mitigation required for the MWD project.

BISCAYNE BAY

Biscayne Bay is a shallow, tidal sound located near the extreme southeastern part of Florida. Biscayne Bay, its tributaries, and Card Sound are designated by the State of Florida as aquatic preserves, while Card and Barnes Sounds are part of the Florida Keys National Marine Sanctuary. A significant portion of the central and southern portions of Biscayne Bay comprise Biscayne National Park. Under the 2012 Water Control Plan and the MWD field test planned deviations, specified canal water levels/ranges are meant to provide flood protection for the portions of the LEC and Miami-Dade County, which may result in discharges to Biscayne Bay.

FLORIDA BAY

Florida Bay and the Ten Thousand Islands comprise approximately 1,500 square miles of ENP. The bay is shallow, with an average depth of less than three feet. To the north is the Florida mainland and to the south lie the Florida Keys. Sheet flow across the marl prairies of the southern Everglades and 20 creek systems fed by Taylor Slough and the C-111 Canal provide direct inflow of freshwater to the bay. Surface water from SRS flows into Whitewater Bay and these flows may also provide essential recharge for central and western Florida Bay. Exchange with Florida Bay occurs when this lower salinity water mass flows around Cape Sable into the western sub-region of the bay.

3.7 REGIONAL WATER MANAGEMENT (OPERATIONS)

The C&SF Project contains multiple water bodies created by the existing C&SF levee infrastructure and implementation of the water management operating criteria, including WCA 1, WCA 2, and WCA 3. Associated with the inflow to and discharge from the water bodies is an infrastructure of structures and canals that are managed by the implementation of water management operating criteria that can include specified water levels or ranges. The WCA 3A Interim Regulation Schedule, which was implemented with ERTP, is a compilation of water management operating criteria, guidelines, rule

curves, and specifications that govern storage and release functions. Typically, a regulation schedule has water level thresholds which vary with the time of year and result in discharges. The threshold lines of regulation schedules define the discharge zones and are traditionally displayed graphically. Additionally, a corresponding table is typically used to identify the structure discharge rules for the zones. As with most regulation schedules, the WCA 1, WCA 2, and WCA 3A regulation schedules must take into account various, and often conflicting, project purposes. The WCAs are regulated for the Congressionally- authorized C&SF Project purposes to provide: flood control; water supply for agricultural irrigation, municipalities and industry, and ENP; regional groundwater control and prevention of saltwater intrusion; enhancement of fish and wildlife; and recreation. An important component of flood control is the maintenance of marsh vegetation in the WCAs, which provide a dampening effect on hurricane-induced wind tides that have the potential to affect residential areas to the east of the WCAs. The marsh vegetation, along with the east coast protection levee, also prevents floodwaters that historically flowed eastward from the Everglades from flowing into the developed areas along the southeast coast of Florida.

Besides releases from WCA 2A via the S-11 structures, WCA 3A receives inflow from pumping stations S-8, S-9, and S-140. The S-9 pump station removes runoff in the area west of Ft. Lauderdale known as Western C-11. The S-9A pump station, located adjacent to the S-9 pump station, returns seepage water from WCA 3A and WCA3B collected in the L-37, L-33 and the US 27 borrow canals. The S-140 pump station serves the 110 square mile area north and east of the interceptor canal and west of L-28. S-140 is used to maintain canal levels below 10.5 feet, NGVD unless gravity flow into WCA 3A is possible at an adequate rate. Water also enters northeastern WCA 3A by gravity through the S-150 gated culvert. Discharges at S-142 are made from WCA 3A into the North New River Canal. The SFWMD can pump runoff from the North New River Canal and the C-13 Canal into WCA 3A through S-142 by operating their pump station, G-123.

Water levels in WCA 3A are managed primarily by five gated spillways: the S-12 structures (S-12A, S-12B, S-12C, and S-12D) and S-333. Additionally, the S-151, S-343A, S-343B and S-344 gated culvert structures can be utilized to discharge from WCA 3A. From July 2002 through October 2012, WCA 3A was regulated according to a seasonally varying 8.75 to 10.75 feet, NGVD regulation schedule and the Rainfall Plan (initiated in 1985), as per IOP (2002 IOP EIS and 2006 IOP Final Supplemental EIS). In October 2012, the WCA 3A Regulation Schedule was revised with implementation of the ERTTP recommended plan through the 2012 Water Control Plan. Revisions to the WCA 3A Regulation Schedule included incorporation of the WCA-3A 1960 9.5 to 10.5 feet NGVD Zone A, along with expansion of Zone D forward to December 31 and expansion of Zone E1 backwards to January 1. The discharges made from WCA 3A through the S-12s and S-333 are target flows determined from the Rainfall Plan; when WCA 3A is in Zone A, these target flows are the maximum flow possible based on structure design capacities and consideration of downstream operational constraints. Under the Rainfall Plan, water deliveries are computed and operations adjusted weekly, if necessary based on the sum of two components: a rainfall response component and a WCA 3A supplemental regulatory component. The Rainfall Plan provides for the rainfall response component within all zones of the WCA 3A Regulation Schedule, with

the additional regulatory release requirement added when the WCA 3A water levels fall within the higher regulation schedule zones above Zone E, including Zone E1. Under current ERTTP water management practice, which were unchanged with both Increment 1 and Increment Plus, discharge capacity from S-333 into the L-29 Canal and NESRS is maximized prior to utilization of the S-12 structures, in order to limit potential effects from WCA 3A discharges on CSSS-A. When flows through the S-12 structures are determined necessary by the WCA 3A Regulation Schedule and the Rainfall Plan, water managers prioritize flow through the easternmost S-12 structures as capacity allows, in order to minimize flow through the S-12A and S-12B structures. The historical operational target flow distribution of 55% through S-333 into NESRS and 45% through the S-12 structures into ENP west of the L-67 Extension is no longer used as a constraint governing water management operations of WCA 3A and northern ENP under ERTTP. Weekly WCA 3A water management release decisions are coordinated with ENP. MWD Increment 1 Plus and MWD Increment 2 specify seasonal closure of the S-343A, S-343B, S-344, S-12A and S-12B structures, with the following rigid closure periods: October 1 through July 14 for S-343A, S-343B, S-344; November 1 through July 14 for S-12A; and December 1 through July 14 for S-12B. Except under prescribed WCA 3A high water conditions, the S-12A and S-12B seasonal closure period will initiate on October 1 annually. There are no prescribed closure periods for S-12C or S-12D, although either or both of these structures may be closed when Rainfall Plan target releases are achieved through S-333.

Water deliveries to eastern ENP (NESRS) are controlled by the stage in L-29 Canal, as pressure from the water within the canal (hydraulic head), is required to force water through the Tamiami Trail culverts and the one mile bridge and into ENP. As the L-29 Canal stage increases, more water is forced beneath the road through 17 sets of culverts (49 total culverts, three culverts per set in most locations) and the one mile bridge. The L-29 Canal maximum operating stage has been limited under ERTTP and previous regional operating plans due to concerns regarding: (1) potential flooding and seepage effects within residential or agricultural areas of Miami-Dade County; (2) potential damage to the Tamiami Trail roadway sub-base; and (3) potential flooding effects to privately-owned real estate adjacent to Tamiami Trail and within eastern ENP. The MWD Tamiami Trail Modifications (TTM) Project, which was completed in December 2013, included construction of the one mile bridge and Tamiami Trail roadway reconstruction/resurfacing to allow for the maximum operating stage in the L-29 Canal to be raised from 7.5 feet to 8.5 feet, NGVD following the acquisition of the required real estate interests by the Corps and ENP. Following completion of the MWD TTM Project, the MWD Increment Plus (Increment 1.1/1.2) water management operating criteria for the L-29 Canal between S-333 and S-334 is meant to limit the L-29 Canal stage to no more than 7.5 to 7.8 feet, NGVD in response to potential flooding effects to privately-owned real estate adjacent to Tamiami Trail and within eastern ENP which may result from extended durations with higher operating stages in the L-29 Canal (above 7.5 to 7.8 feet, NGVD). MWD Increment 1.2 includes the capability to raise the L-29 Canal stage maximum operating limit from 7.5 up to 7.8 feet, NGVD, contingent upon compliance with all of the following conditions: (1) acquisition of required real estate interest and any associated improvements for the private ownership along Tamiami Trail including receipt of Tamiami Trail Bridge and roadway channel and flowage easements from the Florida Department of Transportation; (2) completion of the C-358 Canal (Richmond Drive Seepage Collection Canal) and installation of S-357N (C-358 control structure);

(3) completion of sufficient portions of Contracts 8 (construction of the C-111 NDA L-315 western levee and the L-357W Extension Levee between Richmond Drive and the 8.5 SMA Detention Cell) and completion of the Contract 8A berms inside the 8.5 SMA Detention Cell. Items (1) and (2) have been completed. With regard to Item (3), based on the current projected construction schedule, the remaining segments of the L-315 western levee will be complete by June 30, 2018. In order to raise the maximum operating limit of the L-29 Canal above 7.8 feet, NGVD, the Corps will need to complete construction of the C-111 South Dade NDA (Contracts 8 and portions of Contract 8A) and the 8.5 SMA Project. Completion of the NDA construction is currently projected on June 30, 2018.

When WCA 3A water levels are in Zone A of the WCA 3A Interim Regulation Schedule, S-343A, S-343B, and S-344 can be utilized to discharge from WCA 3A into Big Cypress National Preserve (BCNP) outside if the prescribed closure period for these gated culvert structures. Discharges can also be made through S-343A, S-343B and S-344 when agreed to by SFWMD, Corps, and National Park Service to extend hydroperiods within BCNP. The S-151 gated culvert structure is located along the Miami Canal and operated according to the WCA 3A Interim Regulation Schedule (USACE 2012a). S-151 discharges into the Miami Canal (C-304) in WCA 3B for flood diversion and for the purpose of providing water supply to LEC canals and the SDCS. Effective since November 2017, the S-152 culvert structure can be used to deliver water from WCA 3A to WCA 3B when the WCA 3B stage is less than 8.5 feet NGVD and water quality criteria listed in the operational plan for the Decomp Physical Model (DPM) are satisfied. Under existing conditions, water does not flow directly from WCA 3B into the L-29 Borrow canal. There are two discharge structures, gated spillways S-355A and S-355B, along L-29 south of WCA 3B that are designed to move water from WCA 3B into the L-29 Canal.

There are three distinct modes of water management operations for MWD Increment 1 Plus, which are consistent with the previous Interim Operational Plan for Protection of the Cape Sable Seaside Sparrow (2002, 2006) and E RTP (2012 Water Control Plan): Column 1, Column 2, and water supply. Column 1 refers to the condition when regulatory releases from WCA 3A can be met by normal operation of the WCA 3A regulatory outlets (the S-12 structures, S-333, S-151, S-343A, S-343B, and/or S-344). Column 2 refers to the condition when regulatory releases from WCA 3A are made via S-333 to the L-29 Canal and via S-334 to the L-31N Canal and the SDCS; Column 2 operations generally require the use of pump stations S-331, S-332B, S-332C and S-332D. During Column 2 operations, the control stages along the L-31N Canal are also lowered to minimize potential flood impacts to the SDCS and also to provide the necessary downstream gradient for the S-334 releases to reach S-332B, S-332C, and S-332D pump stations. Column 2 operations are used to offset or mitigate for potential adverse effects on WCA 3A related to actions taken to protect CSSS-A within western ENP, including seasonal closure of the S-12A and S-12B regulatory outlets under 2012/2016 E RTP (S-12C seasonal closure criteria were additionally included with 2002/2006 IOP). The IOP/E RTP generally prescribed that the Column 2 mode of operation would be used when any S-12 structure is closed in order to protect the CSSS (November 1 through July 14, under E RTP), although Column 1 operations would continue until the capacity of the S-12 structures that remain open is insufficient to handle the discharge from WCA 3A. Similarly, the IOP/E RTP generally prescribed that Column 2 operations may continue past re-opening of the S-12 structures (July 15) to mitigate for adverse effects on WCA

3A stage levels resulting from the ERTTP closures of S-12A, S-12B, S-343A, S-343B, and S-344, based on comparison to WCA 3A stage levels that would have been expected under the WCA 3A Regulation Schedule in place prior to the 2000 Interim Structural and Operational Plan (ISOP; the predecessor of IOP 2002); the cited 1985 WCA 3A Regulation Schedule was first incorporated the Rainfall Plan and included no seasonal closures for the S-12s. Under historical IOP and ERTTP operations, the Column 2 mode of operations has also been used as an additional water management tool for WCA 3A high water conditions. Beginning in 2014, the Corps and SFWMD are applying a WCA 3A water budget accounting tool to track the expected effect on WCA 3A stage levels resulting from the ERTTP closures of S-12A, S-12B, S-343A, S-343B, and S-344. Additional restrictions on Column 2 operations have been implemented during the MWD field tests as constraints on inflows into NESRS have been incrementally reduced.

3.8 FLOOD CONTROL

Water management and flood control is achieved in South Florida through a variety of canals, levees, pumping stations, and control structures within the WCAs, ENP, and SDCS. The WCAs provide a detention reservoir for rainfall over the WCAs, excess water from the EAA and parts of the east coast region, and for flood discharge from Lake Okeechobee to tide. The WCAs provide levees to prevent the Everglades floodwaters from inundating the east coast urban areas; provide a water supply for the east coast areas and ENP; improve water supply for east coast communities by recharging underground freshwater reservoirs; reduce seepage; ameliorate salt-water intrusion in coastal well fields; and provide mixed quality habitat for fish and wildlife in the Everglades.

The East Coast Canals are flood control and outlet works that extend from St. Lucie County southward through Martin, Palm Beach, and Broward Counties to Miami-Dade County. The East Coast Canal watersheds encompass the primary canals and water control structures located along the LEC and their hydrologic basins. The main design functions of the project canals and structures in the East Coast Canal area are to protect the adjacent coastal areas against flooding; store water in conservation areas west of the levees; control water elevations in adjacent areas; prevent salt-water intrusion and over-drainage; provide freshwater to Biscayne Bay; and provide for water conservation and public consumption. The East Coast Canals consist of 40 independently operated canals, one levee, and 50 operating structures, consisting of 35 spillways, 14 culverts, and one pump station. The project operates to prevent major flood damage; however, due to urbanization, the existing surface water management system now has to handle greater peak flows than in the past. The SDCS provides a way to deliver water to areas of south Miami-Dade County. This canal system was overlaid on the existing flood control system. Many of these canals are used to remove water from interior areas to tide in times of excess water.

The C-111 South Dade Project was authorized to remove 40 percent of the Standard Project Flood (SPF) flows. This purpose remains an important objective because of the remaining agriculture within the basin. The South-Dade County Basin (south of the S-331 pump station) is provided flood protection by operation of the S-332B/S-332C/S-332D pump stations completed under the C-111 South Dade Project and through operation of the L-31N and C-111 Canal control structures (S-176, S-177, S-18C, and S-

197). The South-Dade County basin may also receive inflows from upstream basin drainage through the S-331 pump station and the adjacent S-173 gated culvert structure. Under the 2012 Water Control Plan and MWD field tests, S-331/S-173 releases are the result of water management operations to: (1) maintain target L-31N Canal stages; (2) provide flood mitigation to the 8.5 SMA eastern areas when sufficient capacity is available at S-357 and maintain flood mitigation for the 8.5 SMA when S-357 operational capacity is limited; and (3) WCA 3A regulatory releases to the SDCS from S-334 during ERTF Column 2 operations. The COP will include regional hydrologic modeling in order to balance the ecological restoration objectives of the MWD and C-111 South Dade projects while demonstrating compliance with the project constraints. This will include flood mitigation requirements to prevent potential MWD project-induced flood damages in the 8.5 SMA and to maintain the level of flood damage reduction associated with the 1994 C-111 GRR-EIS Recommended Plan. The performance of the C-111 South Dade Project features, with respect to both project objectives and constraints, is dependent on the outcome of the COP, including details of the operational plans and operational constraints within WCA 3A, ENP, and the 8.5 SMA.

3.9 VEGETATIVE COMMUNITIES

The Everglades landscape is dominated by a complex of freshwater wetland communities that includes open water sloughs and marshes, dense grass- and sedge-dominated marshes, forested islands, and wet marl prairies. The primary factors influencing the distribution of dominant freshwater wetland plant species of the Everglades are soil type, soil depth, and hydrological regime (USFWS 1999). These communities generally occur along a hydrological gradient with the slough/open water marsh communities occupying the wettest areas (flooded more than nine months per year), followed by sawgrass marshes (flooded six to nine months per year), and wet marl prairie communities (flooded less than six months per year) (USFWS 1999). The Everglades freshwater wetlands eventually grade into intertidal mangrove wetlands and sub tidal seagrass beds in the estuarine waters of Florida Bay. Development and drainage over the last century have dramatically reduced the overall spatial extent of freshwater wetlands within the Everglades, with approximately half of the pre-drainage 2.96 million acres of wetlands being converted for development and agriculture (Davis and Ogden 1997). Alteration of the normal flow of freshwater through the Everglades has also contributed to conversions between community types, invasion by exotic species, and a general loss of community diversity and heterogeneity.

Vegetative communities of the WCAs have suffered from both over-drainage and prolonged periods of inundation associated with the stabilization of water levels (USACE 1999). Many areas of WCA 3A still contain relatively good wetland habitat consisting of a complex of tree islands, sawgrass marshes, wet prairies, and aquatic sloughs. However, the northern portion of WCA 3A has been over-drained, resulting in increased fire frequency and the associated loss of tree islands, wet prairie, and aquatic slough habitat. Northern WCA 3A is currently dominated largely by mono-specific sawgrass stands and lacks the diversity of communities that exists in southern WCA 3A. In southern WCA 3A, Wood and Tanner (1990) first documented the trend toward deep water lily dominated sloughs due to impoundment. In approximately 1991, the hydrology of southern WCA 3A shifted to deeper water and extended hydroperiods resulting in corresponding shifts in vegetation communities (Zweig and Kitchens 2008). Typical

Everglades vegetation, including tree islands, wet prairies, sawgrass marshes, and aquatic sloughs is contained in WCA 3B. However, within WCA 3B, the ridge and slough landscape has been severely degraded by the virtual elimination of overland sheetflow due to the L-67 Canal and Levee system. WCA 3B experiences very little overland flow and has become primarily a rain-fed system pre-dominated by shorter hydroperiod sawgrass marshes with relatively few sloughs or tree islands remaining. Water levels in WCA 3B are also too low and do not vary seasonally, contributing to poor ridge and slough patterning. Loss of sheetflow to WCA 3B has also accelerated soil loss reducing elevations of the remaining tree islands in WCA 3B and making them vulnerable to high water stages.

Vegetative trends in ENP have included a substantial shift from the longer hydroperiod slough/open water marsh communities to shorter hydroperiod sawgrass marshes (Davis and Ogden 1997; Armentano et al. 2006). In addition, invasion of sawgrass marshes and wet prairies by exotic woody species has led to the conversion of some marsh communities to forested wetlands (Gunderson et al. 1997).

The estuarine communities of Florida Bay have also been affected by upstream changes in freshwater flows through the Everglades. A reduction in freshwater inflows into Florida Bay and alterations of the normal salinity balance have affected mangrove community composition and may have contributed to a large-scale die-off of seagrass beds (USFWS 1999). Mangrove communities along Biscayne Bay have also seen a reduction in freshwater inflows and a reduction in historic habitat range by urban and agricultural development leaving only a remnant ribbon of suitable habitat immediately adjacent to the bay. Both bays experiences salinities in excess of 40 practical salinity unit on a seasonal basis. Manatee Bay and Barnes Sound are presently characterized by extended periods with little or no freshwater input, interspersed with erratic large volume discharges from the C-111 Canal, which is presently the major source of freshwater flows.

In contrast to the vast extent of wetland communities, upland communities comprise a relatively small component of the Everglades landscape and are largely restricted to Long Pine Key, the northern shores of Florida Bay, and the many tree islands scattered throughout the region. Vegetative communities of Long Pine Key include rockland pine forest and tropical hardwood forest. In addition, substantial areas of tropical hardwood hammock occur along the northern shores of Florida Bay and on elevated portions of some forested islands.

The vast majority of wetland features within the 8.5 SMA have undergone varying degrees of disturbance related to land clearing for agricultural or residential improvements and invasion by exotic species. Generally, wetlands with the least amount of disturbance are located in the western areas of the 8.5 SMA. The developed (eastern) portion of the 8.5 SMA, except the Federal Aviation Administration (FAA) radar facility, is virtually devoid of wetlands, whereas a zone extending down the central portion is dotted by wetlands intermixed within agricultural and residential land uses. Many of the wetland communities include varying densities of exotics including: Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia* L.), and melaleuca (*Melaleuca quinquenervia*). The 8.5 SMA includes an Australian pine forest that is very dense,

supporting a sparsely vegetated understory and ground cover. A prevalent ground cover species is sawgrass, growing within a thick layer of duff comprised entirely of pine needles. Australian pine can be found in monotypic stands, along marsh and prairie edges, and in abandoned fields. Brazilian pepper is common along roadsides and also forms dense wooded plots throughout the 8.5 SMA (USACE 2012a).

3.10 FISH AND WILDLIFE RESOURCES

Aquatic macro invertebrates form a vital link between the algal and detrital food web base of freshwater wetlands and the fishes, amphibians, reptiles, and wading birds that feed upon them. Important macro invertebrates of the freshwater aquatic community include crayfish (*Procambarus alleni*), riverine grass shrimp (*Palaemonetes paludosus*), amphipods (*Hyalloa aztecus*), Florida apple snail (*Pomacea paludosa*), Seminole ramshorn (*Planorbella duryi*), and numerous species of aquatic insects (USACE 1999).

Small freshwater marsh fishes are also important processors of algae, plankton, macrophytes, and macro invertebrates. Marsh fishes provide an important food source for wading birds, amphibians, and reptiles. Common small freshwater marsh species include the native and introduced golden topminnow (*Fundulus chrysotus*), least killifish (*Heterandria formosa*), Florida flagfish (*Jordenella floridae*), golden shiner (*Notemigonus crysoleucas*), sailfin molly (*Poecilia latipinna*), bluefin killifish (*Lucania goodei*), oscar (*Astronotus ocellatus*), eastern mosquitofish (*Gambusia holbrooki*), and small sunfishes (*Lepomis* spp.) (USACE 1999).

Within the Greater Everglades, numerous sport and larger predatory fishes occur in deeper canals and sloughs. Common species include largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), black crappie (*Pomoxis nigromaculatus*), Florida gar (*Lepisosteus platyrhincus*), threadfin shad (*Dorosoma petenense*), gizzard shad (*Dorosoma cepedianum*), yellow bullhead (*Ameiurus natilis*), white catfish (*Ameiurus catus*), bowfin (*Amia calva*), and tilapia (*Tilapia* spp.) (USACE 1999). Larger fishes are an important food source for wading birds, alligators, otters, raccoons, and mink.

The freshwater wetland complex supports a diverse assemblage of reptiles and amphibians. Common amphibians include the greater siren (*Siren lacertina*), Everglades dwarf siren (*Pseudobranchius striatus*), two-toed amphiuma (*Amphiuma means*), pig frog (*Rana grylio*), southern leopard frog (*Rana sphenoccephala*), Florida cricket frog (*Acris gryllus*), southern chorus frog (*Pseudacris nigrita*), squirrel tree frog (*Hyla squirela*), and green tree frog (*Hyla cinerea*) (USACE 1999). Amphibians also represent an important forage base for wading birds, alligators, and larger predatory fishes (USACE 1999).

Common reptiles of freshwater wetlands include the American alligator (*Alligator mississippiensis*), snapping turtle (*Chelydra serpentina*), striped mud turtle (*Kinosternon bauri*), mud turtle (*Kinosternon subrubrum*), cooter (*Chrysemys floridana*), Florida chicken turtle (*Deirochelys reticularia*), Florida softshell turtle (*Trionys ferox*), water snake (*Natrix sipedon*), green water snake (*Natrix cyclopion*), mud snake (*Francia*

abacura), and Florida cottonmouth (*Agkistrodon piscivorus*) (USACE 1999).

The freshwater wetlands of the Everglades are noted for their abundance and diversity of colonial wading birds. Common wading birds include the white ibis (*Eudocimus albus*), glossy ibis (*Plegadis falcinellus*), great egret (*Casmerodius albus*), great blue heron (*Ardea herodias*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), green-backed heron (*Butorides striatus*), cattle egret (*Bubulcus ibis*), black-crowned night heron (*Nycticorax nycticorax*), yellow-crowned night heron (*Nycticorax violacea*), roseate spoonbill (*Ajaia ajaja*), and wood stork (*Mycteria americana*) (USACE 1999).

Mammals that are well-adapted to the aquatic and wetland conditions of the freshwater marsh complex include the rice rat (*Oryzomys palustris natator*), round-tailed muskrat (*Neofiber alleni*), and river otter (*Lutra canadensis*). Additional mammals that may utilize freshwater wetlands on a temporary basis include the white-tailed deer (*Odocoileus virginianus*), Florida panther (*Puma concolor coryi*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*).

Conditions within the 8.5 SMA provide important resources for opportunistic small animals including raccoons, rabbits, squirrels, songbirds, hawks, kestrels, crows, turkey vultures, frogs, and various reptiles. White-tailed deer have been observed. On-site surveys have found the greatest degree of species richness within the forested wetland systems within the ENP lands to the west of the 8.5 SMA, whereas species richness was lowest in wetlands on higher elevations (7.0-8.0 feet, NGVD) in the eastern regions of the 8.5 SMA, in close proximity to L-31N (USACE 2011). This eastern region of the 8.5 SMA is dedicated to agricultural and residential land uses, and provides only marginal benefits to resident wildlife (USACE 2012a).

The change in fish and wildlife diversity and wetland function between the western and eastern portions of the 8.5 SMA correlates with an elevation gradient (increasing elevations from west to east) and land use. Both elevation and land use are interdependent co-variables as lower elevations correlate with frequent flooding that limits the extent and type of land use. Higher elevations are more compatible with agricultural, commercial, and residential land uses. A recent overview of wildlife observed within the 8.5 SMA can be found in the 2011 Proposed Interim Operating Criteria for 8.5 SMA EA (USACE 2011), and 2012 design refinement for the 8.5 SMA EA (USACE 2012a).

3.11 THREATENED AND ENDANGERED SPECIES

FEDERALLY PROTECTED SPECIES

The Corps has coordinated with USFWS and National Marine Fisheries Service (NMFS), in accordance with Section 7 of the ESA, to determine federally-listed threatened and endangered species that are either known to occur or are likely to occur within the project area (Table 4).

TABLE 4. FEDERALLY THREATENED AND ENDANGERED SPECIES WITHIN THE PROJECT AREA.

Common Name	Scientific Name	Status
Mammals		
Florida panther	<i>Puma concolor coryi</i>	E
Florida manatee	<i>Trichechus manatus</i>	E, CH
Florida bonneted bat	<i>Eumops floridanus</i>	E
Birds		
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	E, CH
Piping plover	<i>Charadrius melodus</i>	T
Red-cockaded	<i>Picoides borealis</i>	E
Roseate tern	<i>Sterna dougallii</i>	T
Wood stork	<i>Mycteria Americana</i>	T
Reptiles		

American Alligator	<i>Alligator mississippiensis</i>	T, SA
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T
Gopher tortoise	<i>Gopherus polyphemus</i>	C
Invertebrates		
Bartram's hairstreak	<i>Strymon acis bartrami</i>	E, CH
Florida leafwing butterfly	<i>Anaea troglodyta</i>	E, CH
Miami blue butterfly	<i>Cyclargus thomasi</i>	E
Schaus swallowtail butterfly	<i>Heraclides aristodemus</i>	E
Stock Island tree snail	<i>Orthalicus reses</i> (not incl.)	T
Plants		
Crenulate lead plant	<i>Amorpha crenulata</i>	E
Deltoid spurge	<i>Chamaesyce deltoidea</i> spp.	E
Garber's spurge	<i>Chamaesyce garberi</i>	T
Okeechobee gourd	<i>Cucurbita okeechobeensis</i> ssp.	E
Small's milkpea	<i>Galactia smallii</i>	E
Tiny polygala	<i>Polygala smallii</i>	E
Big pine partridge pea	<i>Chamaecrista lineata</i> var. <i>keyensis</i>	E
Blodgett's silverbush	<i>Argythamnia blodgettii</i>	T
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	E, CH
Carter's small-flowered flax	<i>Linum carteri</i> var. <i>carteri</i>	E, CH
Everglades bully	<i>Sideroxylon</i> <i>reclinatu</i>	T
Florida brickell-bush	<i>Brickellia mosieri</i>	E, CH
Florida bristle fern	<i>Trichomanes punctatum</i>	E
Florida semaphore cactus	<i>Consolea corallicola</i>	E, CH
Sand flax	<i>Linum arenicola</i>	E
Florida pineland crabgrass	<i>Digitaria pauciflora</i>	T
Pineland sandmat	<i>Chaemaesyce</i>	T
Florida prairie clover	<i>Dalea carthagensis</i>	E
	<i>floridana</i>	

STATE LISTED SPECIES

The project area also provides habitat for several state listed species **Table 5**.

TABLE 3. STATE LISTED SPECIES WITHIN THE PROJECT AREA

Common Name	Scientific Name	Status
Mammals		
Everglades mink	<i>Mustela vison evergladensis</i>	T
Birds		
American oystercatcher	<i>Haematopus palliatus</i>	T
Black skimmer	<i>Rynchops niger</i>	T
Florida sandhill crane	<i>Antigone Canadensis pratensis</i>	T
Least tern	<i>Sterna antillarum</i>	T
Little blue heron	<i>Egretta caerulea</i>	T
Reddish egret	<i>Egretta rufescens</i>	T
Roseate spoonbill	<i>Ajaja ajaja</i>	T
Southeastern American kestrel	<i>Falco sparverius paulus</i>	T
Tricolored heron	<i>Egretta tricolor</i>	T
White-crowned pigeon	<i>Columba leucocephalus</i>	T
Invertebrates		
Miami blue butterfly	<i>Cyclargus [=Hermiargus] thomasi bethunebakeri</i>	E
Plants		
Pine-pink orchid	<i>Bletia purpurea</i>	T
Lattace vein fern	<i>Thelypteris reticulata</i>	E
Eatons spikemoss	<i>Selaginella eatonii</i>	E
Wright's flowering fern	<i>Anemia wrightii</i>	E
Tropical fern	<i>Schizaea pennula</i>	E
Mexican vanilla	<i>Manilla Mexicana</i>	E

E=Endangered; T=Threatened; SC=Species of Special Concern

3.12 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act, 16 USC 1801 et seq. Public Law 104-208 reflects the Secretary of Commerce and Fishery Management Council authority and responsibilities for the protection of essential fish habitat (EFH). The southern estuaries comprise Biscayne National Park and a large portion of ENP and are a shallow estuarine system (average depth less than 3 feet). Florida Bay is the main receiving water of the greater Everglades. The southern estuaries contain essential fish habitat for corals; coral reef and live bottom habitat; red drum (*Sciaenops ocellatus*); penaeid shrimps; spiny lobster (*Panulirus argus*); other coastal migratory pelagic species and the snapper-grouper complex. Essential fish habitat in the southern estuaries is comprised of seagrasses, estuarine mangroves, intertidal flats, the estuarine water column, live/hard bottoms, and coral reefs.

3.13 WATER QUALITY

Water quality in the study area is significantly influenced by development. The C&SF Project led to significant changes in the landscape by opening large land tracts for urban development and agricultural uses, and by the construction of extensive drainage networks. Natural drainage patterns in the region have been disrupted by the extensive array of levees and canals which has resulted in further water quality degradation. The water quality of the study area is largely controlled by Lake Okeechobee and the EAA to the north and urban and agricultural development southeast of ENP. The northern WCAs are fed from Lake Okeechobee as well as runoff from the EAA. Stormwater Treatment Areas (STAs) were constructed to reduce total phosphorus from surface water runoff releases from Lake Okeechobee. Water quality impairment within the study area can generally be attributed to nutrients and bioavailable forms of mercury. A short discussion of nutrients is provided below followed by a review of water quality within the project area. This Proposed Action will have no impacts on mercury deposition (atmospheric source) or mercury methylation (due to factors not influenced by this Proposed Action, such as sulfur content in the water column etc.).

NUTRIENTS

Nutrients such as phosphorus and nitrogen compounds are a concern in the estuaries, WCAs, ENP, and Lake Okeechobee since they result in an imbalance of flora and fauna. To address nutrient discharges the FDEP has recently established surface water quality numeric nutrient criteria for all Florida water bodies and developed National Pollution Discharge Elimination (NPDES) Total Maximum Daily Loads (TMDLs) for many watersheds with excessive nutrient pollution. TMDLs for phosphorus and/or nitrogen currently exist for Lake Okeechobee. Additional information on the status and implementation of TMDLs within the study area can be found at <http://www.dep.state.fl.us/water/tmdl/>.) Within the Everglades Protection Area, phosphorus concentrations are regulated by the “Phosphorus Rule” 62-302.540 F.A.C. and are subject to the terms of the 1992 Consent Decree in *United States v. South Florida Water Management. District* (S.D. Fla No. 88-1886-CIV-MORENO).

Total phosphorus (TP) is the primary nutrient of concern within WCA 3 and NESRS. Currently all indications are that the WCAs have recovered from the dry season conditions and any additional flows routed into SRS or C-111 basin as a result of this action will be consistent with TP values normally observed during the wet season following recovery from dry season conditions.

Figure 11 illustrates background information on TP concentrations at SRS and northern WCA 3A inflows. The marsh conditions have improved significantly since the initial opening of the S-333 (May 22, 2018) for the 2018 wet season. First grab sample (May 29, 2018) collected at the S-333 subsequent to the initial opening of the S-333 was 54 part per billion (ppb) TP. The most recent S-333 grab sample data collected (June 18, 2018) with a value of 9 ppb TP indicates that the marsh recovery from dry season conditions is well underway or possibly complete. S12-C and S12-D had TP values of 7 and 10 ppb TP respectively on June 18, 2018.

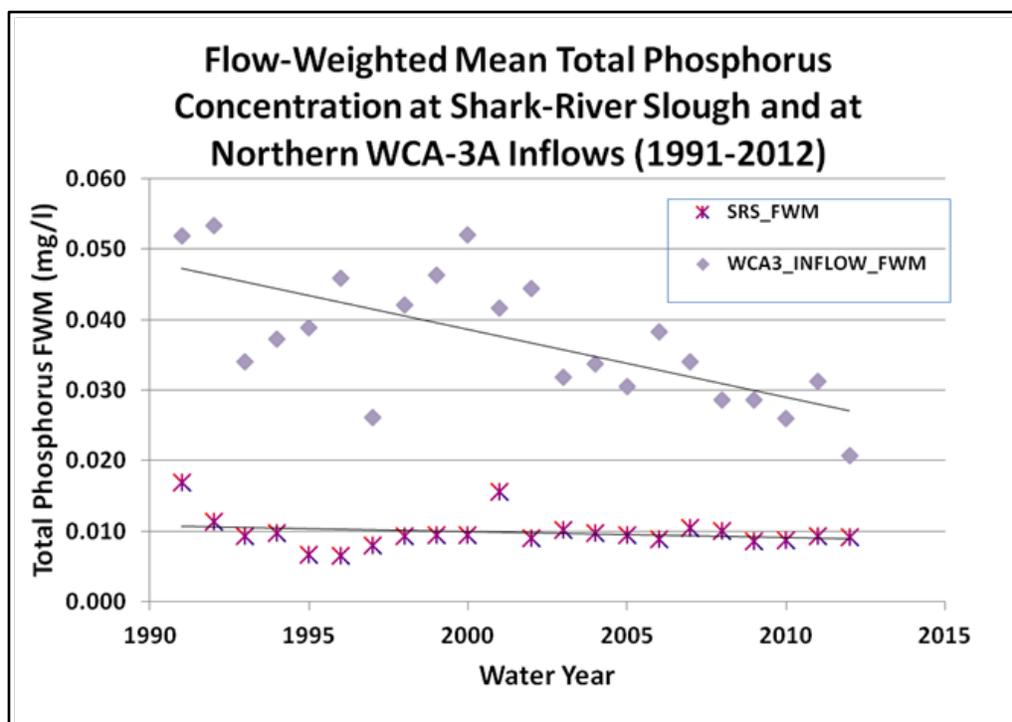


FIGURE 11. FLOW-WEIGHTED MEAN TOTAL PHOSPHORUS CONCENTRATION AT SHARK RIVER SLOUGH AND NORTHERN WCA 3A INFLOWS.

3.14 NATIVE AMERICANS

There are two federally recognized tribes (Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida) that are located within and adjacent to the project area (**Figure 12**). Both tribes maintain a strong connection to the project area through continued use and regard the indigenous populations of Florida as their ancestors. The project area includes a large segment of the Miccosukee Tribe's Alligator Alley Reservation which spans portions of WCA 3A, the Tamiami Trail Reservation Area which consists of three parcels of land used for commercial services, and the Miccosukee Reserved Area which is the center of the Miccosukee Indian population. In addition, both tribes have leases and easements within WCA 3A and have historically recognized rights within ENP that stems from the Native Americans who lived within the ENP boundary prior to the parks creation.

The Miccosukee Tribe of Indians of Florida and Seminole Tribe of Florida have a long history of living within the project area. Both tribes moved into the region during the eighteenth and nineteenth centuries from Georgia and Alabama. Fleeing the U.S. Army and the forced relocation policies of the Indian Removal Act (1830), the Miccosukee and Seminoles were part of Native American groups commonly referred to as Seminoles; however, there are references to some of the groups involved in the conflict as Mikasuki, which supports the subsequent separation of the two groups (Weisman 1999). Many of these groups fled into the swamp areas of South Florida and made their homes within the Everglades and other remote areas of region. The coming of the Civil War led to the abandonment of the removal efforts and the various Native American groups were largely left alone until the late nineteenth century. In 1928 the Tamiami Trail

opened, cutting through the Everglades and bringing along with it tourists and explorers into the region, and, for the first time, bringing complete access for the various tribes to participate in the larger economy that was growing in South Florida.

As early as 1894, the Federal governmental and later the State of Florida started to acquire lands within the Big Cypress area. However, initial attempts to relocate tribal members to these areas failed as there were simply no incentives to abandon traditionally occupied areas in favor of the new lands (Weisman 1999). "The Indian New Deal changed that, and for the first time, services, programs, and land were brought together...at Big Cypress" (Weisman 1999:125). In the 1930s, the Federal Government started to bring services to the various Seminole groups. Some of the groups relocated and started to receive Federal aid, while some groups resisted government intrusion into their lives and remained in various traditional areas that now included sites along Tamiami Trail (Weisman 1999). Throughout the next two decades the Federal Government instituted various aid programs to assist the Native American groups living within the reservations until the early 1950s. In the early 1950s, the Federal Government's policies radically changed, as it was felt that native groups should now join "mainstream society" and that Federal aid should come to an end (Weisman 1999:131). Being faced with a reduction in support and possible termination of recognition as a group by the government, various Native American groups on these reservations began to organize and form their own tribal governments to assist in the protection of their interests. In 1957, the Seminole Tribe of Florida received Federal recognition. However, wishing to remain separate and to maintain their own identity, many of the groups along the Tamiami Trail refused to join and instead held out to form their own government that would be federally recognized in 1962 as the Miccosukee Tribes of Indians of Florida.

Today most of the Miccosukee Tribe lives within the confines of the reservation located along the forty mile bend of Tamiami Trail while many of the Seminoles Tribal members live on various reservations properties with the largest being those of Big Cypress, Hollywood, and Brighton Reservations. In addition to the Federal reservation, the Miccosukee Tribe has also established a perpetual lease to large portions of the WCA 3A area while the Seminole Tribe has a lease within the northwestern portion of WCA 3A. The members of both groups maintain a traditional life style that is intricately connected to the Everglades. Traditional practices of hunting, fishing and general living are still maintained, along with modern entrepreneurship through various enterprises such as cattle ranching and with tourism related businesses along Tamiami Trail. Today, both tribes have vibrant, thriving cultures based within the Everglades region. These practices continue to tie the Tribes to the Everglades in such a way that careful consideration of effects is warranted.

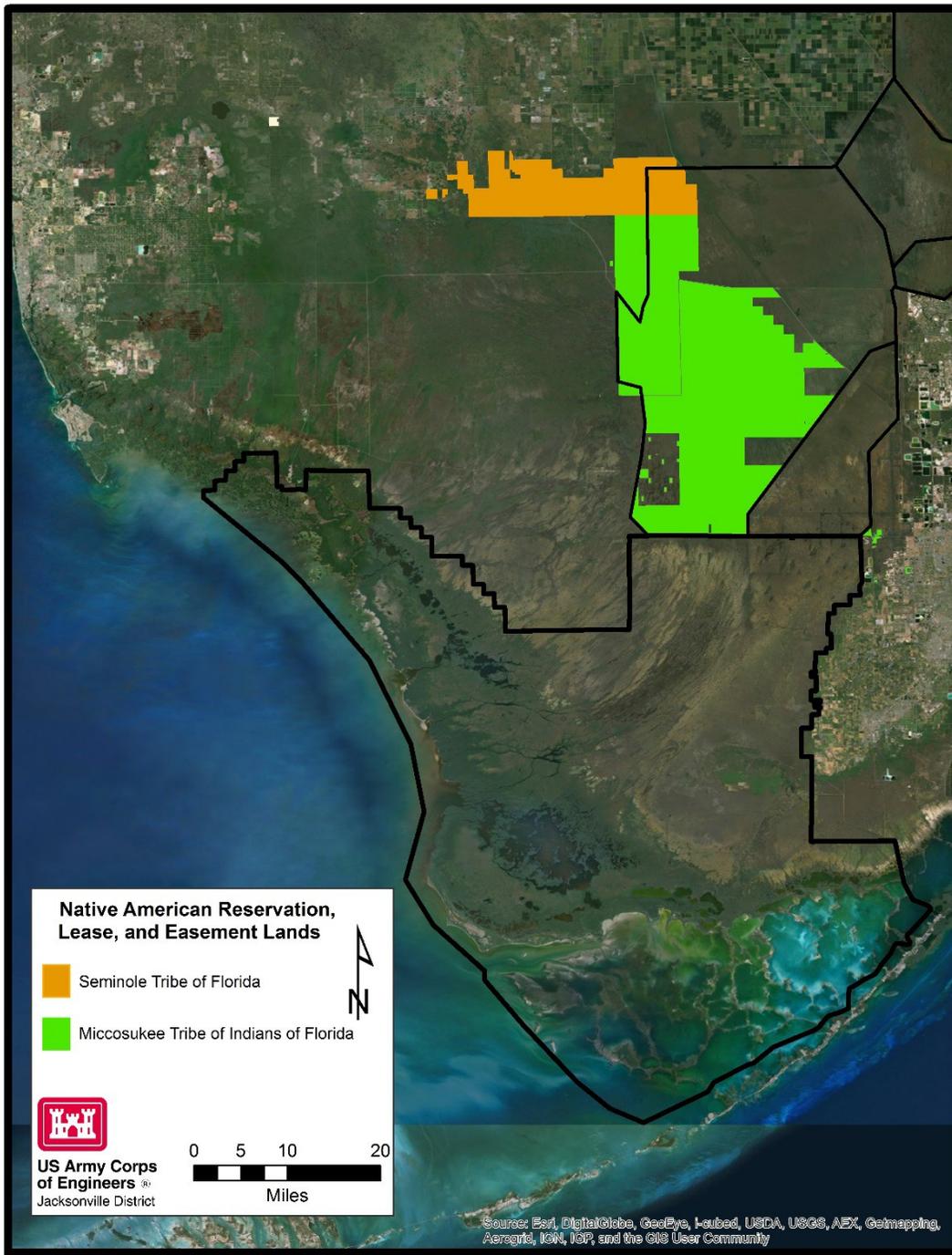


FIGURE 12. MAP OUTLINING THE LOCATION OF TRIBAL RESERVATION, LEASED AND EASEMENT LANDS.

3.15 CULTURAL RESOURCES

Within the larger region that includes ENP and WCA3, there are numerous recorded archeological sites indicative of Native American habitation. Prior to European contact,

the Everglades were a heavily populated area. Native Americans traveled via canoe and on foot through the saw grass and inhabited many of the tree islands that dot the landscape. The earliest known habitation sites date to the Early Archaic period (7,500 BC) when the Everglades were much drier. However, within the larger area of South Florida, evidence of Paleo-Indian (12,000 to 7,500 BC) habitation has also been recorded (i.e. Warm Mineral Springs (8SO18) and Little Salt Spring (8SO79) (Griffin 1988). Some of the Early Archaic habitation sites have only recently been rediscovered as the result of managed drainage programs in South Florida. As the climate warmed and sea level rose, many Native Americans abandoned the lowest of the tree islands as they became submerged. This process continued through what is known as the Middle Archaic, until climate conditions stabilized around 300 BC at the start of the Late Archaic. Today many sites from both the Early and Middle Archaic periods are no longer submerged and may have more modern Native American use.

After the Archaic period, the region became incorporated into what is known as the Glades region and remained inhabited until European contact, when Old World diseases and slave raiding heavily reduced the Native populations during the late 1,500s-1,700s. Many of the tree islands through this portion of the Everglades have sites associated to the Glades period. This period has been broken down into successive stages starting with Glades I, which dates from 500 BC to 750 AD, Glades Period II dating from 750 to 1,200 AD, and Glades Period III dating from 1,200 AD to European contact in the 1,500s. Typical habitation sites through this region are commonly referred to as middens, which are the accumulation of daily life activities on these tree islands. Material remains can stretch from the surface to well over one meter below the surface on certain islands. Native American burials can also be found among these habitation sites.

After European contact, Native American populations in the region continuously declined and remained at low levels until Miccosukee and Seminole tribal groups moved into the area while fleeing the U.S. Army and U.S. Governments' forced relocation program. Many sites associated with both the Miccosukee and Seminole tribes are known to exist throughout the region.

The broad region of ENP and WCA 3 has been subject to numerous cultural resource investigations and have been found to contain a wide variety of cultural resources that vary within their significance. There are archaeological resources associated with some of the earliest habitation sequences within South Florida and relatively recent sites directly associated with modern Native American tribes who were removed from ENP shortly after its creation.

Approximately 277 cultural resources, as identified in the Florida Master Site File, are located within the project area. Of these resources, 121 sites are located within WCA 3 north of the L-29 canal. The majority of these sites were identified based on a 1987 aerial analysis of the WCA and the presence of archaeological materials was not ground-truthed (Taylor 1987). Only approximately 25 sites within WCA 3 have been identified based on a physical archaeological investigation. A total of 8 cultural resources within WCA3 have been listed or determined eligible for listing in the National Register of Historic Places (NRHP), including Mack's Fish Camp Historical District.

The southern portion of the project area, south of the L-29 Canal, is located entirely within ENP. ENP has been subject to many archaeological investigations that have identified approximately 156 cultural resources within the project area. Of these resources, 40 have been listed or determined eligible for listing in the NRHP, including two archaeological districts. A small portion of Ten Thousand Islands Archaeological District is located on the western edge of the project area and the SRS Archaeological District is contained entirely within the project area. The SRS Archaeological District contains no less than 63 archaeological resources, 39 of which are contributing resources to the district (Schwandron 1996). Sites typically found within the SRS are described as earth middens; however, multi-occupation sites such as Tiger Hammock (8DA11) which is associated with Glades II and III and Seminole occupations have also been identified.

3.16 AIR QUALITY

Air monitoring reports are prepared annually by FDEP to inform the public of the air pollutant levels throughout the State of Florida. All areas within the state are designated with respect to each of the six pollutants (carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particle pollution (10 microns or less in diameter (PM₁₀), and 2.5 microns or less in diameter (PM_{2.5}), and sulfur dioxide (SO₂)) as attainment (*i.e.*, in compliance with the standards); non-attainment (*i.e.*, not in compliance with the standards); or unclassifiable (*i.e.*, insufficient data to classify). Attainment areas can be further classified as maintenance areas. Maintenance areas are areas previously classified as non-attainment which have successfully reduced air pollutant concentrations to below the standard. Southeast Florida including Miami-Dade County continues to be classified by the U.S. Environmental Protection Agency (EPA) as an attainment/maintenance area for ozone. Florida remains designated as unclassifiable for PM₁₀. Although sufficient data have been collected for attainment determinations, EPA has not considered PM₁₀ for attainment determinations in Florida yet.

3.17 HAZARDOUS, TOXIC OR RADIOACTIVE WASTES

Along the southern boundary of WCA 3A and WCA 3B there are levees and canals constructed in the 1950s and 1960s that limit vehicle access to the interior. Activity within the WCA is generally limited to fishing, hunting, and birding though there may be some illegal dumping of solid wastes along the perimeter. No soil testing for residual contaminants has been conducted within the WCA 3A and WCA 3B as part of this project since the lands have no history of prior agricultural or industrial use that would cause such contamination.

A search of FDEP petroleum spill and storage sites database done in October of 2014 identified six petroleum storage sites and one spill site along Tamiami Trail between S-333 and S-356. Petroleum storage at Everglades Safari site was closed in 2005; however, a petroleum spill at this site is listed as ongoing as of October 2014. Petroleum storage facilities operated by the SFWMD are located at the S-333 and S-356 structures.

A search of FDEP's databases of contamination sites and petroleum storage facilities identified five spill sites and 15 petroleum storage facilities located along the canal or within the 8.5 SMA. The SFWMD is listed as the permit holder for storage facilities at the S-357 and S-331 pump stations. The spill at the SFWMD's S-331 pump station has

been completed. A spill at the General Portland, Inc. facility west of the canal is listed as ongoing. Three non-petroleum cleanup sites are located along the L-31N Canal. Two of the sites are located along the L-31N Canal buffer trail and one is located within the 8.5 SMA.

3.18 NOISE

Noise levels are associated with surrounding land use. Within the major natural areas of South Florida, external sources of noise are limited and of low occurrence. Existing sources of noise are limited to vehicular traffic travelling on roads adjacent to and cutting through the project area. Other sources of noise which may occur within these natural areas include air boats, off road vehicles, swamp buggies, motor boats, and occasional air traffic. Sources of noise in rural areas include noise associated with agricultural production such as the processing and transportation of agricultural produce. Within the rural municipalities and urban areas, sound levels would be expected to be of greater intensity, frequency, and duration. Noise associated with transportation arteries, such as highways, railroads, primary and secondary roads, airports, operations at commercial and industrial facilities etc., inherent in areas of higher population would be significant and probably override those sounds associated with natural emissions.

3.19 AESTHETICS

The visual characteristics of South Florida can be described according to the three dominant land use categories: natural areas, agricultural lands, and urban areas. The natural areas consist of a variety of upland and wetland ecosystems, including lakes, ponds, vast expanses of marsh and wet prairie, with varying vegetative components. Uplands are often dominated by pine, although other sub-tropical and tropical hardwoods do occur. Overall, the land is extremely flat, with few natural topographic features such as hills or other undulations. Much of the visible topographic features within the natural areas are man-made. Generally, urban development is concentrated along the LEC. Development is typically immediately adjacent to or nearby protected natural areas.

3.20 SOCIOECONOMICS

Florida's economy is characterized by strong wholesale and retail trade, government, and service sectors. The economy of South Florida is based on services, agriculture, and tourism. The three counties that comprise the LEC are heavily populated. Much of the land within the area potentially impacted is within ENP and is publicly owned. However, a number of privately owned parcels still exist within this region. Several private entities currently own real estate within the project area adjacent to Tamiami Trail and within ENP (**Figure 13**). Property owners include three airboat concessionaires, the Airboat Association of Florida, Florida Power and Light, Lincoln Financial Media, and Salem Communications. Efforts by the Corps and DOI/ENP to acquire real estate interests for all privately owned properties and the channel and flowage easements for the Tamiami Trail Bridge and roadway to allow raising of the L-29 Canal maximum operating limit above 7.5 feet NGVD were completed by August 2017.

The Miccosukee Indian Tribe of Florida currently lease two areas adjacent to Tamiami Trail (Osceola and Tigertail Camps) and have several businesses adjacent to Tamiami

Trail west of S- 333 including the Miccosukee Indian Village, Restaurant and airboat concessionaires.

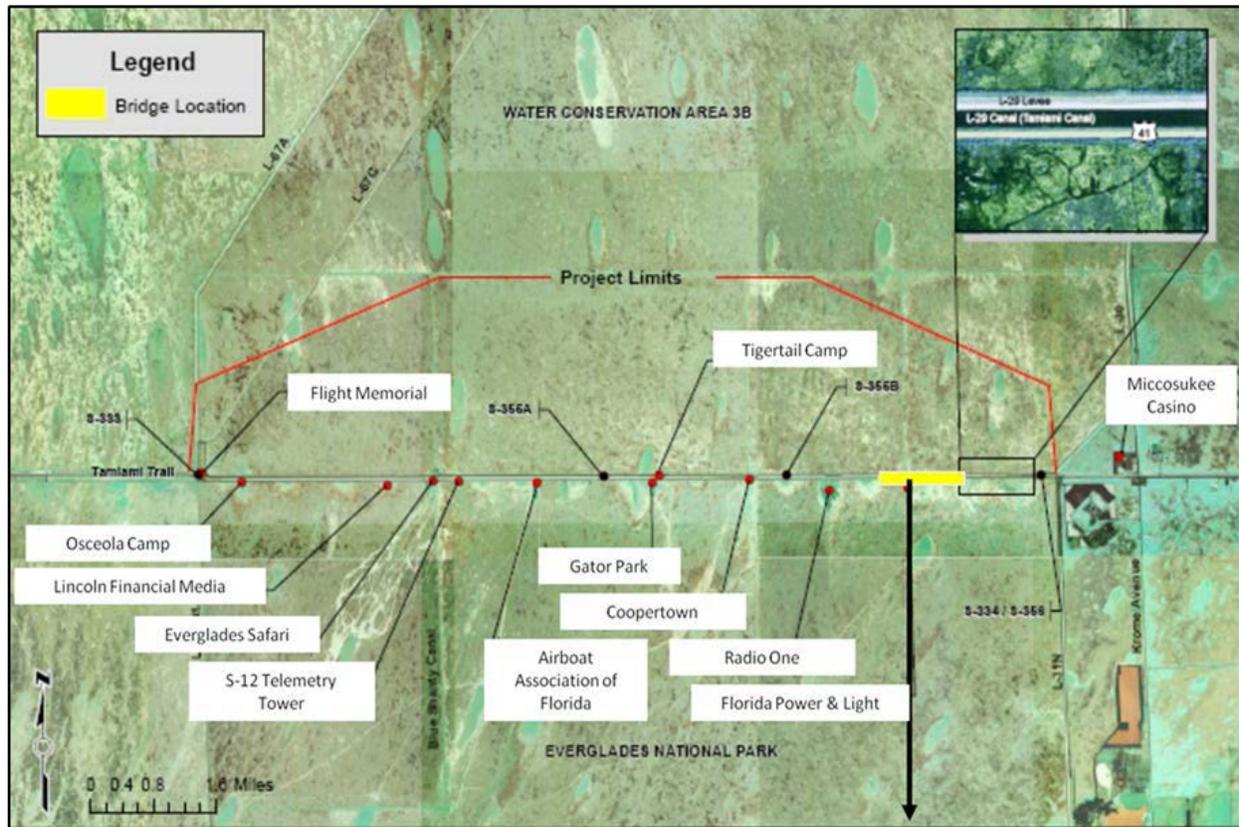


FIGURE 13. LOCATIONS OF PRIVATELY OWNED REAL ESTATE WITHIN THE PROJECT AREA.

The 8.5 SMA is located in the East Everglades, approximately 20 miles southwest of Miami, ten miles north of Homestead, and 6.6 miles south of U.S. Highway 41. It is bounded on the east by L-31N, on the west by NESRS (part of ENP), on the north by SW 104th Street, and on the south by SW 168th (Richmond Drive) Street. The 8.5 SMA presently encompasses approximately ten square miles of mixed use development. Approximately 42 percent (2,699 acres) of the 8.5 SMA is classified as wetlands, one percent (65 acres) as uplands, and 57 percent (3,646 acres) as residential and/or agricultural lands based on a Wetland Rapid Assessment Procedure (WRAP) performed for the 2000 GRR/FSEIS (USACE 2000). The eastern region of the 8.5 SMA is dedicated to agricultural and residential land uses (USACE 2012a).

3.21 AGRICULTURE

The Miami-Dade County agricultural industry is unique in both the types of commodities produced and the method of cultivation. The majority of agricultural activities in the county are located south of Tamiami Trail and east of ENP. A variety of vegetables, fruits, and ornamentals are grown within this region and include many tropical and subtropical crops, which are grown year-round. The most active growing season is between September and May. Because of the wet and dry rainy seasons in the area,

planting times are controlled by the elevation of ground water. Soils in these agricultural areas are rocky soils and marl soils.

3.22 RECREATION

There are many recreational opportunities throughout South Florida. WCA 3 has been used for recreational activities including hunting, fishing, frogging, boating, camping, and off-road vehicle use. Private camps are located throughout WCA 3. A variety of other nature-based recreational opportunities are also provided to the public within WCA 3. These activities include wildlife viewing and nature photography. Hiking and bicycling are also permitted on existing levees within the project area where appropriate. There are also several recreation areas at locations along the boundary of WCA 3. Similar recreational opportunities are provided in ENP.

4.1 ENVIRONMENTAL EFFECTS

4.2 GENERAL ENVIRONMENTAL EFFECTS

Environmental effects are expected to be spatially limited and small in magnitude given the short duration of the Proposed Action. Potential environmental effects of current water management operations (No Action Alternative) are thoroughly evaluated within the MWD Increment 1 Plus EA and FONSI (dated February 16, 2017) and MWD Increment 2 EA and FONSI (dated February 21, 2018) are hereby incorporated by reference. Please refer to the MWD Increment 1 Plus EA and FONSI and MWD Increment 2 EA and FONSI for additional information.

Potential reductions in high water levels and decreased periods of prolonged flooding is expected to provide temporary benefits to vegetation and fish and wildlife resources, including Federally threatened and endangered species such as the wood stork (*Mycteria americana*) and Everglade snail kite (*Rostrhamus sociabilis plumbeus*).

Since water levels within the Everglades have historically fluctuated on a seasonal, annual, and interannual basis, it is likely that cultural resources within the project area have been previously exposed to natural hydrological conditions that may be experienced under the current condition. However, continued increasing high water levels observed in the No Action Alternative has the potential for negative impacts on some cultural resources within WCA 3A where high water levels and prolonged inundation periods are expected to continue. Implementation of the Action Alternatives would reduce water levels in WCA 3A and help to control flooding at cultural resources locations. Implementation of the Action Alternatives would increase flows to SRS. Results of the modeling conducted on prior studies, generally indicate higher water levels just south of the L-29 Canal with progressively lower water stages as the flow moves south. While tree islands within SRS and ENP may experience high water levels, general archaeological predictive models indicate that the presence of archaeological sites are indicative of a preference of higher elevations for habitation uses within tree islands. Water levels are project to be lower than maximum water levels that have been experienced in the past as indicated by water level averages experienced under the last ten years of IOP (Everglades Depth Estimation Network [EDEN]). In addition, the temporary nature and short duration of the project would also preclude adverse effects to historic properties within the project area. Therefore, the Corps has determined that increased water levels during the temporary Action Alternatives will not adversely affect historic properties listed or eligible for listing in the NRHP.

There are many recreational opportunities throughout South Florida. WCA 3 has been used for recreational activities including hunting, fishing, frogging, boating, camping, and off-road vehicle use. Other nature-based activities include wildlife viewing and nature photography. Hiking and bicycling are also permitted on existing levees within the project area where appropriate. High water levels are currently limiting access to recreational opportunities within the project area. The FWC has closed access to the WCAs within the project area leading to economic losses within the region and impacts on local businesses.

Potential losses in tree islands as a result of high water levels are expected to occur if the Proposed Action is not taken. Loss of tree islands has the potential to impact cultural

resources and culturally important ceremonies practiced by Native American Tribes within the project area.

TABLE 4. SUMMARY OF POTENTIAL ENVIRONMENTAL CONSEQUENCES ASSOCIATED WITH IMPLEMENTATION OF THE NO ACTION AND ACTION ALTERNATIVES.

	Alternative A (No Action)	Alternative C (CSSS Closure)
Climate	Implementation of Alternative A would not result in significant impacts to the climate of South Florida.	Implementation of Alternative C would not result in significant impacts to the climate of South Florida.
Geology & Soils	Alternative A is expected to have beneficial effects on geology and soils within ENP due to improvements in	No additional effects beyond those described for Alternative A.
Land Use	No Effect	No Effect
Hydrology	Potential impacts to ENP eastern Panhandle and Manatee Bay and Barnes Sound as a result of expected increases in frequency and duration of low volume discharges from S-197 relative to	Minor reduction to the duration of high water stages within WCA 3A.
Regional Water Management	No Effect	Increased capacity relative to Alternative A to reduce stages in WCA 3A due to operational
Flood Control	Risks associated with overtopping of S- 12A/B structures. Increased risks to levee integrity	Ability to reduce prolonged high stages in WCA 3A while maintaining flood mitigation for 8.5 SMA and flood

	<p>flood stages exceed the maximum historical observed stage of 12.7 feet NGVD.</p>	<p>protection for C-111 South Dade agriculture. Continued progress towards completion of ongoing C-111 South Dade construction contracts, critical infrastructure necessary to achieve long-term objectives to improve hydroperiods in</p>
<p>Vegetative Communities</p>	<p>Minor beneficial effects on vegetation within ENP through continued implementation. Potential losses in tree islands as a result of high water levels are expected to occur if the Proposed Action is not taken.</p>	<p>Minor beneficial effects to vegetation within WCA 3A, including tree islands through reduction in water elevations. Potential minor adverse effects on CSSS habitat due to early opening of S-12A/B, S-343A/B and S-344</p>
<p>Fish & Wildlife Resources</p>	<p>Major adverse effects to terrestrial wildlife within WCA 3A due to high stages and limited dry ground for foraging, loafing and resting. High water levels inundate tree islands and other wildlife habitats and if sustained, will cause stress and</p>	<p>Minor beneficial to birds and mammals within WCA 3A due to reduction in water elevations, providing dry ground for foraging, loafing and resting.</p>

<p>Threatened and Endangered Species</p>	<p>Potential negative effects to threatened wood stork and endangered Everglade snail kite due to effects of prolonged high stages on nesting and foraging ability within WCA 3A.</p>	<p>No additional effects anticipated other than those outlined within Alternative A.</p> <p>Potential beneficial effects to threatened wood stork and endangered Everglade snail kite due to limiting of prolonged high stages on nesting and foraging ability within WCA 3A.</p> <p>The Corps determined that the Proposed Action may affect, but is not likely to adversely affect,</p>
<p>Essential Fish</p>	<p>No Effect</p>	<p>No Effect</p>
<p>Water Quality</p>	<p>The operation of S-328 allows S-332D flows to directly enter the L-31W which is directly adjacent to adjacent to the ENP, a designated Outstanding Florida Waterway. It is likely that this new flow input to the ENP will be low in phosphorus but there is a potential for nutrient spikes during initial discharges after a dry out period. A water quality monitoring plan has</p>	<p>No additional effects anticipated other than those outlined within Alternative A.</p>

	approved by the Corps.	
Native Americans	Potential adverse effect on Tribal properties through prolonged high stages within WCA 3A.	Alternative C reduces potential for adverse effects on Tribal properties through reduction of prolonged high stages within WCA
Cultural Resources	Potential losses in tree islands as a result of high water levels are expected to occur if the Proposed Action is not taken. Loss of tree islands has the potential to impact cultural resources and culturally important ceremonies practiced by	Alternative C reduces potential for adverse effects on historic properties through reduction of prolonged high stages within WCA 3A. No adverse effect to historic properties.
Air Quality	No Effect	No Effect
Hazardous, Toxic and Radioactive	No Effect	No Effect
Noise	No Effect	No Effect
Aesthetics	No Effect	No Effect
Socioeconomics	Potential minor adverse effects due to FWC closures for recreational hunting within WCA 3A. High water stages pose an immediate threat and impact to valuable natural resources that underpin local economies that surround the Everglades Protection Area.	Implementation of Alternative C would benefit recreation through reduction in high water stages in WCA 3A, thereby reducing duration of FWC closures. Through reduction of stages in WCA 3A, Alternative C would assist to reduce the immediate threat and impact to valuable natural

		surround the Everglades Protection
Agriculture	No effect due to additional water management operating criteria for features of the SDCS (<i>i.e.</i> S-197) to mitigate for potential risks to flood protection for areas within South	No additional effects beyond those described for Alternative A.
Recreation	Recreation in WCA 3A is currently limited due to FWC closures.	Implementation of Alternative C would benefit recreation through reduction in high water stages in WCA 3A, thereby reducing duration

5.1 LIST OF AGENCIES AND PERSONS CONSULTED

The Corps has been in coordination with other Federal and state agencies, and tribal representatives regarding the Proposed Action. Parties include the SFWMD, FDEP, U.S. Environmental Protection Agency (USEPA), USFWS, FWC, ENP, Department of the Interior, Florida Department of Agriculture and Consumer Services, State Historic Preservation Office, Seminole Tribe of Florida, the Seminole Nation of Oklahoma, and the Miccosukee Tribe of Indians of Florida. This coordination is a result of the magnitude of Corps efforts underway to implement water management strategies in South Florida. **Appendix B** of this EA includes documentation of all coordination regarding this action.

5.2 NATIVE AMERICAN TRIBES

As part of the consideration of effects, consultation with the appropriate federally recognized tribes was initiated on June 19, 2018 and is ongoing (refer to **Appendix B**). The Miccosukee Tribe of Indians of Florida have expressed their continued desire for the S-12 structures to remain open year-round. The Miccosukee Tribal Representative verbally concurred with the Corps' determination of no adverse effect to historic properties that are listed or eligible for listing in the NRHP. The Seminole Nation of Florida and the Seminole Nation of Oklahoma also concurred with the Corps' determination of no adverse effect. Consultation with other interested, federally-recognized tribes is ongoing and will be finalized prior to implementation of the Proposed Action.

5.3 U.S. ENVIRONMENTAL PROTECTION AGENCY

The Corps contacted the USEPA Region 4 for the purpose of notification and discussion of NEPA (**Appendix B**). The Corps has completed an EA in accordance with ER 200-2-2 (Corps policy for NEPA compliance) to address the federal action of the planned temporary deviation to the water control plan. The Corps may generate a supplemental EA as necessary to discuss and disclose any additional effects to the human environment that may not have been addressed within this EA. EPA staff were contacted on June 19, 2018. USEPA acknowledged receipt of the Corps notification via correspondence on June 20, 2018, indicating an appreciation of the early coordination and noted that the EA will be reviewed by their agency once available.

5.4 U.S. FISH & WILDLIFE SERVICE

The USFWS was contacted several times since June 5, 2018 with the latest correspondence date June 27, 2018. Emergency consultation pursuant to Section 7 of the ESA is on-going with the USFWS under provisions of the 2016 ERTTP BO and in full compliance with the ESA. The Corps has determined that the Proposed Action may affect, but is not likely to adversely affect, the endangered CSSS, endangered Everglade snail kite and threatened wood stork.

As of June 27, USFWS concurred with opening of S-344 structure on July 1, 2018 (Appendix B). However, at this time, USFWS is not in concurrence with opening of the other CSSS Closure Structures (i.e. S-12A, S-12B, S-343A and S-343B). The Corps will continue close coordination with USFWS and if system conditions change, the Corps will revisit early openings of these structures in consultation with USFWS.

5.5 FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Coordination with the Florida State Clearinghouse was conducted on June 19, 2018. The State Clearinghouse Coordinator concurred with the Corps determination that the deviation request is consistent to the maximum extent practicable with Florida's Coastal Management Program in correspondence dated June 20, 2018. The Proposed Action is not anticipated to adversely affect water quality and water quality certification is not necessary. On June 20, 2018, the FDEP issued an EFO (OGC No.: 18-1066) in response to high rainfall and flooding in the South Florida Region. The EFO states that the Corps and SFWMD are hereby authorized to make temporary operational changes in order to minimize detrimental impacts to the environment, to the public, to adjacent properties, and to downstream receiving water. The FDEP EFO waives the requirement for state water quality certification for this Federal Action. The EFO expires November 30, 2018. The Proposed Action is in compliance with the Clean Water Act.

5.6 SOUTH FLORIDA WATER MANAGE DISTRICT

The SFWMD has coordinated with stakeholders during the development of the operational strategy (**Appendix A**) and concurs with the Proposed Action.

5.7 STATE OF FLORIDA-STATE HISTORIC PRESERVATION OFFICER

As part of the consideration of effects, consultation with the Florida State Historic

Preservation Officer was initiated on June 19, 2018 and is ongoing (refer to **Appendix B**).

5.8. FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

The FWC was contacted on June 19, 2018. FWC acknowledged receipt of the Corps notification via correspondence on June 20, 2018.

5.9 FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

Coordination with the Florida Department of Agriculture and Consumer Services was conducted on June 19, 2018.

6.1 CUMULATIVE EFFECTS

Cumulative effects are defined in 40 CFR 1508.7 as those effects that result from: the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The primary goal of cumulative effects analysis is to determine the magnitude and significance of the environmental consequences of the Proposed Action in the context of the cumulative effects of other past, present, and future actions. The Proposed Action is expected to help to mitigate for severe economic losses currently being experienced as a result of high water levels. The general environmental effect of the Proposed Action would be beneficial and any downstream impacts would be of short duration.

6.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment might be the mining of a mineral resource. An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction. The Preferred Alternative consists of an operational change to current water management practices and does not include construction of permanent structures or structural modifications to existing C&SF Project features. The Proposed Action would not cause the permanent removal or consumption of any natural resources.

6.3 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Environmental effects for each resource are discussed above. Adverse environmental effects associated with implementing the Preferred Alternative are expected to be temporary based on the short duration (two weeks) of this planned temporary deviation and the generally beneficial nature of this action. Inundation duration within CSSS-A and CSSS-Ax habitat may be longer than under the No Action Alternative due to the early opening of the CSSS Closure Structures by approximately 2 weeks. Since the majority of the CSSS habitat within this area is already inundated, there is a potential for an additional up to 2 weeks of inundation based upon the early opening.

6.4 CONFLICTS AND CONTROVERSY

Over the lifetime of the C&SF Project, considerable interest has been generated among local and regional stakeholders. The Corps continually strives to include all interested parties in its decision making process and will continue to consider all issues that arise.

6.5 ENVIRONMENTAL COMMITMENTS

The Corps commits to avoiding, minimizing or mitigating for adverse effects. All practicable means to avoid or minimize environmental effects were incorporated into the Preferred Alternative.

7.1 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

7.2 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and this EA has been prepared and coordinated for public, state, and Federal agency review. The Proposed Action is in compliance with the National Environmental Policy Act.

7.3 ENDANGERED SPECIES ACT OF 1973

Upon completion of an assessment for species under National Marine Fisheries Service purview it was determined that the Proposed Action would have no effect on these species; therefore, consultation with NMFS was not necessary.

The USFWS was contacted several times since June 5, 2018 with the latest correspondence date June 27, 2018. Emergency consultation pursuant to Section 7 of the ESA is on-going with the USFWS under provisions of the 2016 ERTF BO and in is full compliance with the ESA. The Corps has determined that the Proposed Action may affect, but is not likely to adversely affect, the endangered CSSS, endangered Everglade snail kite and threatened wood stork.

As of June 27, USFWS concurred with opening of S-344 structure on July 1, 2018 (Appendix B). However, at this time, USFWS is not in concurrence with opening of the other CSSS Closure Structures (i.e. S-12A, S-12B, S-343A and S-343B). The Corps will continue close coordination with USFWS and if system conditions change, the Corps will revisit early openings of these structures in consultation with FWS.

7.4 FISH AND WILDLIFE COORDINATION ACT OF 1958, AS AMENDED

The Proposed Action has been fully coordinated with USFWS and FWC. In response to the requirements of this Act, the Corps has and will continue to maintain continuous coordination with USFWS and FWC. The Proposed Action is in full compliance with the Act.

7.5 NATIONAL HISTORIC PRESERVATION ACT OF 1966

The Proposed Action is in compliance with Section 106 of the National Historic Preservation Act, as amended (PL 89-665). As part of the requirements and consultation process contained within the National Historic Preservation Act implementing regulations of 36 CFR 800, this project is also in compliance through ongoing consultation with the Archaeological and Historic Preservation Act, as amended (PL 93-29), Archeological Resources Protection Act (PL96-95), American Indian Religious Freedom Act (PL 95-341), Native American Graves Protection and Repatriation Act (NAGPRA) (PL 101-601), Executive Order 11593, 13007, and 13175, the Presidential Memo of 1994 on Government to Government Relations and appropriate Florida Statutes. Consultation with the Florida SHPO, appropriate Federally-recognized tribes, and other interested parties has been initiated and is ongoing (Reference **Appendix B**). Consultation with the Florida SHPO, appropriate federally recognized tribes, and other interested parties was initiated on June 19, 2018. The Seminole Nation of Oklahoma, the Seminole Tribe of Florida, and the Miccosukee Tribe of Indians of Florida concurred with

the Corps' determination of no adverse effect. Coordination on effects with other interested parties and the appropriate federally recognized tribes is ongoing and will be finalized prior to implementation of the Proposed Action. The Proposed Action will be in compliance with the goals of this Act upon completion of coordination as stated above.

7.6 CLEAN WATER ACT OF 1972

The Proposed Action is not anticipated to adversely affect water quality and water quality certification is not necessary. On June 20, 2018 the FDEP issued an EFO (OGC No.: 18-1066) in response to high rainfall and flooding in the South Florida Region. The EFO states that the Corps and SFWMD are hereby authorized to make temporary operational changes in order to minimize detrimental impacts to the environment, to the public, to adjacent properties, and to downstream receiving water. The FDEP EFO waives the requirement for state water quality certification for this Federal Action. The EFO expires November 30, 2018. The Proposed Action is in compliance with the Clean Water Act.

7.7 CLEAN AIR ACT OF 1972

The Proposed Action is being coordinated with the State of Florida. The Proposed Action is in compliance with Section 176 of the Clean Air Act, known as the General Conformity Rule. The Proposed Action will not cause or contribute to violations of the National Ambient Air Quality Standards.

7.8 COASTAL ZONE MANAGEMENT ACT OF 1972

Coordination with the Florida State Clearinghouse was conducted on June 19, 2018. The State Clearinghouse Coordinator concurred with the Corps determination that the deviation request is consistent to the maximum extent practicable with Florida's Coastal Management Program in correspondence dated June 20, 2018.

7.9 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland would be impacted by implementation of the Proposed Action. This Act is not applicable.

7.10 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic river reaches would be affected by project related activities. This Act is not applicable.

7.11 MARINE MAMMAL PROTECTION ACT OF 1972

No marine mammals would be harmed, harassed, injured or killed as a result of the Proposed Action. Therefore, the Proposed Action is in compliance with this Act.

7.12 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by the Proposed Action.

7.13 FEDERAL WATER PROJECT RECREATION ACT OF 1965, AS AMENDED

Recreation and fish and wildlife enhancement have been given full consideration in the Proposed Action.

7.14 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

No fisheries or other areas under the purview of NMFS would be affected by this action. The Proposed Action is in compliance with the Act.

7.15 SUBMERGED LANDS ACT OF 1953

Significant effects to fish and wildlife resources and vegetative communities within submerged lands of the State of Florida are not expected. The Proposed Action is in compliance with the Act.

7.16 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by the Proposed Action. These Acts are not applicable.

7.17 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), AS AMENDED BY THE HAZARDOUS AND SOLID WASTE AMENDMENTS (HSWA) OF 1984, COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA), TOXIC SUBSTANCES CONTROL ACT (TSCA) OF 1976

Implementation of the Proposed Action is not expected to result in the discovery of HTRW since there is no excavation or other construction activities associated with this project. The Proposed Action has a very low risk for increased mobilization of existing HTRW where it might exist within the study area. The Proposed Action is in compliance with these Acts.

7.18 RIVERS AND HARBORS ACT OF 1899

The Proposed Action would not obstruct navigable waters of the United States. The Proposed Action is in full compliance.

7.19 SAFE Drinking Water Act of 1974, As Amended

The Proposed Action would not impact safe drinking water standards. The Proposed Action is in full compliance.

7.20 UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 (PUBLIC LAW 91-646)

Acquisition of real estate is not required for the Proposed Action. The Proposed Action is in compliance with this Act.

7.21 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected. The Proposed Action is in compliance with the Act.

7.22 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

Migratory and resident bird species have been observed within the project area and are likely to use available habitat for foraging, nesting, and breeding. The Proposed Action is not expected to destroy migratory birds, their active nests, their eggs, or their hatchlings. The Proposed Action will not pursue, hunt, take, capture, kill or sell migratory birds. The Proposed Action is in compliance with these Acts.

7.23 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

The Marine Protection, Research and Sanctuaries Act does not apply to the Proposed Action. Ocean disposal of dredge material is not proposed as part of the Proposed Action.

7.24 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

No Essential Fish Habitat would be impacted by this action. Therefore the Proposed Action is in compliance with this Act.

7.25 E.O. 11990, PROTECTION OF WETLANDS

The Proposed Action is expected to have beneficial effects on wetlands. The Proposed Action is in compliance with the goals of this Executive Order (E.O.).

7.26 E.O. 11988, FLOODPLAIN MANAGEMENT

This E.O. instructs Federal agencies to avoid development in floodplains to the maximum extent possible. The Proposed Action is an operational change to existing infrastructure; therefore, no construction is proposed. This action is consistent with the intent of this E.O. and is in compliance.

7.27 E.O. 12898, ENVIRONMENTAL JUSTICE

E.O. 12989 provides that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority or low income populations. The Proposed Action would not result in disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The Proposed Action is in compliance with this E.O.

7.28 E.O. 13089, CORAL REEF PROTECTION

No coral reefs would be impacted by the Proposed Action. This E.O. does not apply.

7.29 E.O. 13112, INVASIVE SPECIES

The Proposed Action would have no significant impact on invasive species. The Proposed Action is in compliance with the goals of this E.O.

7.30 E.O. 13045, PROTECTION OF CHILDREN

E.O. 13045, requires each Federal agency to “identify and assess environmental risk and safety risks [that] may disproportionately affect children” and ensure that its “policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This action has no environmental safety risks that may disproportionately affect children. The Proposed Action is in compliance.

7.31 E.O. 13186, RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS

Migratory and resident bird species have been observed within the project area and are likely to use available habitat for foraging, nesting, and breeding. The Proposed Action is not expected to destroy migratory birds, their active nests, their eggs, or their hatchlings. The Proposed Action is in compliance with the goals of this E.O.

8.0 LIST OF PREPARERS**TABLE 5. TABLE OF PREPARERS**

Name	Organization	Role in EA
Gina Ralph	USACE	Biologist
Jenna May	USACE	Biologist
Melissa Nasuti	USACE	Biologist
Dan Crawford	USACE	Hydrologist/Engineer
Lan Do	USACE	Water Manager
Savannah Lacy	USACE	Water Manager
Jim Riley	USACE	Water Quality
Meredith Moreno	USACE	Archeologist

9.1 PUBLIC INVOLVEMENT

9.2 SCOPING AND EA

Reference **Section 1.9**.

9.3 AGENCY COORDINATION

The Corps is in continuous coordination with other Federal and state agencies, Tribal representatives, and members of the general public. This extensive coordination is a result of the magnitude of Corps efforts underway to implement water management strategies in South Florida. All agency coordination letters related to the Proposed Action are included in **Appendix B**.

9.4 LIST OF RECIPIENTS

A notice of availability for the EA and FONSI was mailed to Federal and state agencies, Tribal representatives, and members of the general public. A complete mailing list is available upon request. The EA and FONSI was also posted the internet at the following address:

<http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#>

10.0 REFERENCES

- Armentano, T.V., J.P. Sah, M.S. Ross, D.T. Jones, H.C. Colley, and C.S. Smith. Rapid Responses of Vegetation to Hydrological Changes in Taylor Slough, Everglades National Park, Florida. *Hydrobiologia* 569 (2006): 293-309.
- Davis, S.M., and J.C. Ogden. *Everglades: the Ecosystem and its Restoration*. Delray Beach, Florida, USA: St. Lucie Press, 1997.
- Griffin, John W. *The Archeology of Everglades National Park: A Synthesis*. National Park Service, Southeast Archeological Center, Tallahassee, Florida, 1988.
- Gunderson, L.H., C.S. Holling, G. Peterson, and L. Pritchard. *Resilience in Ecosystems, Institutions and Societies*. Beijer Discussion Paper Number 92, Stockholm, Sweden: Beijer International Institute for Ecological Economics, 1997.
- Schwandron, Margo. 1996. *Archeological Resources of Everglades National Park MPS*. Manuscript on file National Park Service.
- Thomas, T.M. "A Detailed Analysis of Climatological and Hydrological Records of South Florida with Reference to Man's Influence upon Ecosystem Evolution." In *Environments of South Florida: Present and Past*, Memoir No. 2, by P.J. Gleason, 81-122. Coral Gables, Florida, USA, 1974.
- USACE. *General Design Memorandum and Environmental Impact Statement, Modified Water Deliveries to Everglades National Park, Jacksonville Florida, USA, June 1992*.
- USACE. *C-111, Central and Southern Florida Project for Flood Control and Other Purposes, Final General Reevaluation Report and Environmental Impact Statement, Miami-Dade County, Jacksonville, Florida, USA, 1994*.
- USACE. *Central and Southern Florida Project Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement. Jacksonville, Florida, USA: Jacksonville District. 1999*.
- USACE. "Central and South Florida Project, Modified Water Deliveries to Everglades National Park, Florida: 8.5 Square Mile Area." *General Reevaluation Report, Jacksonville, Florida, USA. 2000*.
- USACE. *Interim Operational Plan for the Protection of the Cape Sable Seaside Sparrow Final Supplemental Environmental Impact Statement, Jacksonville, Florida, December 2006*. USACE. *Modified Water Deliveries Modified Water Deliveries to Everglades National Park Tamiami Trail Modifications Final Limited Reevaluation Report and Environmental Assessment, U.S. Army Corps of Engineers, Jacksonville District, June 2008*.

- USACE. Central and Southern Florida Project Comprehensive Everglades Restoration Plan C- 111 Spreader Canal Western Project Final Integrated Project Implementation Report and Environmental Impact Statement, Jacksonville, Florida, USA. 2011a
- USACE. Everglades Restoration Transition Plan Final Environmental Impact Statement.
Jacksonville, Florida, USA: Jacksonville District, 2011b.
- USACE. Environmental Assessment; Design Refinement for the 8.5 Square Mile Area, Miami- Dade County, Jacksonville, Florida, August 2012a.
- USACE. Environmental Assessment for Expansion of Canal 111 (C-111) Detention Area and Associated Features South Miami-Dade County, Florida, Jacksonville, Florida, May 2012b.
- USACE. Central and South Florida Project: Water Control Plan for Water Conservation Areas, Everglades National Park, and ENP-South Miami-Dade Conveyance System. Jacksonville, Florida, October 2012c.
- USACE. Environmental Assessment; G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy, U.S. Army Corps of Engineers, Jacksonville District, May 2015.
- USACE. 2016 EA and Proposed FONSI for modifications to the C-111 South Dade North and South Detention Areas and associated features. 2016a
- USACE. Environmental Assessment and Proposed Finding of No Significant Impact: Modifications to the C-111 South Dade Project (L-31 West), U.S. Army Corps of Engineers, Jacksonville District. 2016b.
- USACE. Environmental Assessment; L-29 Canal and South Dade Conveyance System Temporary Emergency Deviation to Affect Relief of High Water Levels within Water Conservation Area 3A, U.S. Army Corps of Engineers, Jacksonville District, February 2016 - 2016c
- USACE. Supplemental Environmental Assessment; L-29 Canal and South Dade Conveyance System Temporary Emergency Deviation to Alleviate High Water Levels in Water Conservation Area 3A, U.S. Army Corps of Engineers, Jacksonville District, May 2016.- 2016 d
- USACE. Environmental Assessment Temporary Emergency Deviation to Alleviate High Water Levels in Water Conservation Area 3A (S-344 Deviation), U.S. Army Corps of Engineers, Jacksonville District, April 2016. -2016e
- USFWS. 1999. South Florida Multi-Species Recovery Plan. Southeast Region, Atlanta, Georgia, USA.

- Weisman, Brent R. 1999 *Unconquered People: Florida's Seminole and Miccosukee Indians*.
Gainesville: University of Florida Press.
- Wood, J.M. and G.W. Tanner, 1990. Graminoid community composition and structure within four everglades management areas. *Wetlands* 10(2): 127-149.
- Zweig, C.L, and W.M. Kitchens. "Effects of Landscape Gradients on Wetland Vegetation Communities: Information for Large-Scale Restoration." *Wetlands* 28, no. 4 (2008): 086-1096